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The title page and index for Volume II are furnished with the December, 1920, number.

Articles to Appear Soon

The Reliability of the Binet Scale and Pedagogical Scales by *Arthur S. Otis and Herbert E. Knollin.*

The Measurement of High-School English by *E. W. Dolch.*

Methods of Interpreting Results in the Cleveland Arithmetic Tests by *Joseph Peterson.*

JOURNAL *of* EDUCATIONAL RESEARCH

VOLUME III MARCH, 1921 NUMBER 3

THE EDUCATION OF TEACHERS IN FOURTEEN STATES[1]

W. RANDOLPH BURGESS
Formerly Russell Sage Foundation, now Federal Reserve Bank of New York

The Annual Report of the Commissioner of Education of Massachusetts for the year 1920[2] contains a tabulation showing the educational qualifications of teachers in service in Massachusetts schools at ten-year periods from 1875 to 1920. The following table quotes selected figures from the detail given in the report.

TABLE I. EDUCATIONAL QUALIFICATIONS OF TEACHERS IN MASSACHUSETTS

Year	Percent Graduates of Colleges(a)	Percent Graduates of Normal Schools	Total Percent Graduates of Colleges or Normal Schools
1874–75	.....	19.4	19.4
1884–85	.....	29.3	29.3
1894–95	6.3	36.0	42.3
1904–05	13.7	47.5	61.3
1913–14	16.0	55.3	71.3
Jan. 1920	16.8	69.1	85.9

(a) Includes some teachers who held both college and normal-school diplomas.

Table I indicates that in a period of 45 years the number of trained teachers in Massachusetts schools has increased from less than one-fifth to more than five-sixths of the entire force. It is

[1] The first of two articles on the education of teachers in service in the United States. The subject of the second article will be "The Rate of Progress in Teacher Preparation."

[2] Proof sheets of portions of the report have been furnished to the writer through kindness of Commissioner Payson Smith.

further notable that the rate of improvement during the war-disturbed years from 1914 to 1920 has been as rapid as during any period.

Valuable Unused Figures

The figures which have been quoted are interesting, however, not simply because of the facts which they reveal but also because of the type of inquiry which they represent. During the past few weeks the writer has been making a search through school reports to discover what figures are available on the educational preparation of teachers. The search revealed the fact that at least fourteen states have been carrying in their annual or biennial school reports data to show how many of the teachers in service are graduates of colleges or of normal schools. A number of other states list simply the normal-school graduates in service. Only in rare instances, however, have the figures for different years been brought into comparison to indicate whether or not there is improvement in the composition of the teaching force. In fact in very few of the reports have percents been computed to show what proportion of the teachers are college or normal trained. The United States Commissioner of Education has never attempted to collect figures as to the education of teachers for his annual report. In fact the only comparison between states in the matter of teacher preparation which the writer has been able to discover is contained in the report of the Commissioner of Education for 1891–1892, one of the early reports of Dr. William T. Harris. In a single table are brought together from different state reports the numbers and percents of normal-school graduates on the teaching force in ten states and the numbers and percents of college graduates teaching in four states. The states which were represented in this tabulation showed an average of about 16 percent of the teachers to be graduates of normal schools and 4 percent graduates of colleges, or a total of about 20 percent of the force graduates of some institution of normal or collegiate rank. The figures given were largely for New England and north central states and they were, moreover, on a number of somewhat different bases. Since that time the number of states attempting to keep some such record has more than doubled and mechanism of collecting data has been greatly improved.

Recent Studies of Teacher Preparation

Recent statistical studies of teacher preparation have taken the form of cross-section samplings of special groups of teachers. Studies made by Coffman,[3] Thorndike,[4] and the Carnegie Foundation,[5] while they yielded a fuller knowledge of the facts as to teacher preparation, and the relationships between the education, experience, and salary of the teacher, did not give a basis for year-to-year, or interstate comparisons. The latest study conducted by Strayer and Evenden for the American City Bureau[6] gives an admirable basis for intercity comparisons of teacher preparation, and if repeated in future years can yield an index of municipal progress in this important particular. It does not give a basis for comparisons between states, or go back of the current year.

In this article the writer proposes to bring together for useful comparison the available facts as to the comparative education of the teaching force in fourteen different states. The first step will be to present the figures for these states and the second will be to propose a statistical method for facilitating ready comparisons between the records of different states and between the records of different years.

The Greatest Common Denominator

State reports carry figures for the educational preparation of teachers in diverse forms. The Massachusetts reports of recent years give the following:

1. Graduates of college and normal school
2. Graduates of college
3. Graduates of normal school
4. Graduates of city-training school
5. Graduates of secondary school only
6. Not graduates of secondary school

This represents in some respects the most complete classification encountered. Other states list besides the graduates the numbers

[3] Coffman, Lotus D., *The social composition of the teaching population*, New York: Teachers College, Columbia University, 1911.

[4] Thorndike, E. L., *The teaching staff of secondary schools in the United States* (U. S. Bureau of Education Bulletin, 1909, No. 4).

[5] *The professional preparation of teachers for American public schools*. Bulletin number 14, New York 1920.

[6] *Know and help your schools*. New York: American City Bureau, 1920.

of teachers who attended college or normal school but did not graduate and still others distinguish between those who graduated from state normal schools and those who graduated from other normal schools. One or two states have attempted to classify teachers by the number of years' training they have received beyond grammar school. As a rule the difficult decisions as to what should count as a year, the large amounts of clerical labor, and the cost of printing involved in this tabulation, have militated against its publication from year to year. The two figures common to the largest number of reports were the figures for college graduates and normal-school graduates on the teaching force.

The Graduation Standard

While the use of these two figures is made necessary by the circumstances of the case they are about as satisfactory for the purposes of comparative statistics as any which could be secured without an extended independent inquiry. College and normal-school graduation have come to be terms with considerable definiteness of meaning. College graduation has in general come to mean four years of study beyond secondary school. Normal-school graduation has been in the past a much less definite term. The normal-school course might extend anywhere from one to four years and secondary-school graduation might or might not be required for entrance to the teacher-training course. In the past twenty years, however, there has been remarkable progress toward standardization. The recent report of the United States Bureau of Education on "Statistics of Normal Schools 1917–1918" contains a careful tabulation of entrance requirements and length of course in both state and private normal schools. It is clear from this compilation that with some exceptions normal-school graduation in this country now means the completion of two years of study beyond the equivalent of a secondary-school course. The exceptions are in two directions, towards a course shorter than two years and towards a course longer than two years. In general the states which have the largest numbers of normal-school graduates tend to have the longer courses of study and those which have the fewest normal-school graduates tend to have shorter courses. Therefore in making a comparison between states on the basis of normal-school graduates in service whatever error there is will be

in the direction of penalizing the better states and favoring the poorer. It is believed that the net result of this error is not large in the case of the fourteen states under conside ation.

It will have to be conceded at once that the two figures for numbers of college graduates and numbers of normal-school graduates do not tell us all we should like to know concerning the educational preparation of teachers. Further information would be desirable show'ng the amount of work undertaken in normal school, college, or university which did not result in graduation. An ideal inquiry would reveal for each teacher the number of full high-school, normal-school, col ege, and university years completed. Summer school courses, short courses, and uncompleted or unsuccessful years would be turned into their full-year equivalents. Accurate statistics of this type are, however, peculiarly difficult to collect on a large scale and over a term of years because they involve much labor of compilation and much judgment on the part of the persons reporting.

The figures which are available, however, do give us the most essential facts which we want to know. College and normal graduation are two accepted standards of teacher preparation. The proportion of the teaching force in any state who have completed full courses of instruction at normal schools or colleges is a real indication of the kind and amount of training teachers are receiving. It is a measure of the extent to which recognized and accepted standards are being realized.

A Ten-year Period

The available figures from different states have been tabulated for a period of ten years from 1910 to 1920. This period has been selected because of the scarcity and diminishing reliability of figures before that date, and because a ten-year period gives perhaps the best indication of current tendencies. The latest published state reports are in the main for the year 1917–1918. For records of the school terms of 1918–1919 and 1919–1920 the writer is indebted to the chief school officers of the different states, who have been good enough to furnish data in advance of publication. In several instances the figures for 1920 had not yet been tabulated. The state school officers also checked through the figures for their states in order to detect any apparent errors.

Fourteen States in 1918

For the school year 1917–1918, figures are available from fourteen states showing the total teachers in service and the numbers of these who were graduates of colleges or of normal schools. The data as they were taken from state reports, or furnished by state school officials, are shown in Table II.

TABLE II. PREPARATION OF TEACHERS IN FOURTEEN STATES 1918

State	College Graduates	Normal-School Graduates	Total Teachers
Massachusetts(a)	3,273	12,639	18,681
Rhode Island	441	2,055	2,934
New Jersey	2,537	11,184	16,689
Connecticut(b)	1,037	4,294	7,404
New Hampshire	653	1,139	3,068
Colorado	1,425	2,359	6,926
Minnesota	2,774	6,175	18,768
Montana	867	1,560	5,600
Wisconsin	2,090	4,868	16,745
Illinois	5,666	6,871	34,597
Virginia(c)	1,043	3,587	13,904
North Dakota(d)	698	1,774	7,712
West Virginia(c)	846	2,480	10,978
Kansas	2,241	1,957	16,398
Total	25,591	62,932	180,404

(a) Figures for Boston estimates on basis of percents in 1920.
(b) 1918–1919.
(c) Division between colleges and normal schools partly estimated.
(d) 1916–1917.

As the total number of teachers in public schools in the United States in 1918 was 650,000 the 180,394 teachers listed in Table II therefore represent between one-quarter and one-third of all of the teachers in the country. The group is representative of different parts of the country, although New England is somewhat too heavily weighted and the southern states are too lightly weighted. The amount of teacher preparation shown is probably somewhat greater than in the nation as a whole.

As far as possible only day-school teachers have been included in the table, and administrative officers excluded. As a rule the

whole number of different teachers rather than the number teaching at one time is given. On these and other minor points differences between the state reports have made entirely similar bases impossible. It is probable also that the figures from some of the states are lacking in completeness. It is believed that the figures are as accurate, however, as most figures similarly collected. Percents computed from Table II to show the proportions of college and normal-school graduates among the teachers of the different states are shown in Figure 1. The black portion of the bar for each state shows the percent of the teachers who are college graduates, the cross-hatched portion, the percent who are normal-school graduates and the hollow portion the percent who are not graduates of either normal school or college. Massachusetts leads the list with 17.5 percent of her teachers college graduates and 67.7 percent normal-school graduates. Five eastern states make by far the best records. Then follow five western and north central states. The two Virginias with North Dakota and Kansas are in the four bottom positions. The percent of college graduates runs from 21.3 in New Hampshire to 7.5 in Virginia, while the range of the normal-school figures is from 70 percent in Rhode Island to 12 percent in Kansas.

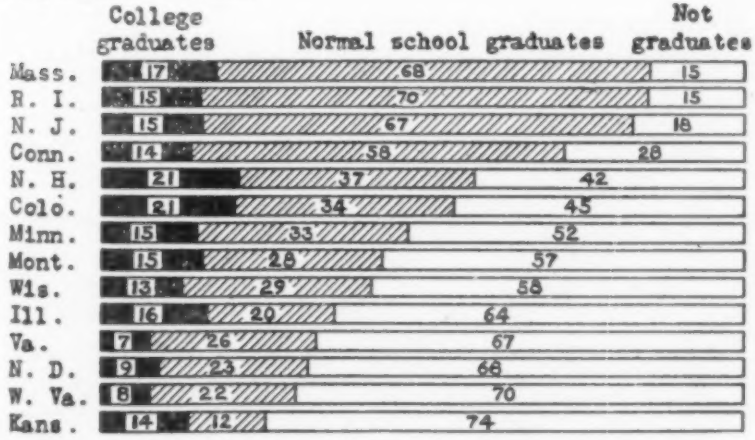
College graduates
Normal school graduates
Not graduates
Mass. 17 68 15
R. I. 15 70 15
N. J. 15 67 18
Conn. 14 58 28
N. H. 21 37 42
Colo. 21 34 45
Minn. 15 33 52
Mont. 15 28 57
Wis. 13 29 58
Ill. 16 20 64
Va. 7 26 67
N. D. 9 23 68
W. Va. 8 22 70
Kans. 14 12 74

FIGURE 1. Percent of teachers in fourteen states who were college or normal-school graduates, 1918

If there were a total bar it would show that of the 180,000 teachers for whom figures are available almost exactly half are

college or normal-school graduates. If one were to take an average of the percents, giving each state equal weight, the ratio would be higher showing 55.5 percent of the teachers in the average state to be graduated from college or normal school.

A Single Index Number

It is clearly desirable to have one single number by which to express the amount of teacher preparation in a state. There should be for purposes of comparing states, tracing progress from year to year, or computing correlations a single measure of the diffusion of teacher training in the state. For this purpose it is proposed to use the average number of years per teacher of completed training beyond high schools. The figure may be computed for any state by multiplying the number of college graduates by four and the number of normal-school graduates by two, and then dividing the sum of these two products by the total number of teachers. The resulting figure indicates the number of years of higher training each teacher would have if all the years of complete training were distributed evenly among them. On this basis the index figures for fourteen states for 1918 are shown in

TABLE III. INDEX NUMBERS FOR TEACHER PREPARATION IN FOURTEEN STATES IN 1918

State	Index Number
Massachusetts	2.054
Rhode Island	2.000
New Jersey	1.948
Connecticut	1.720
New Hampshire	1.588
Colorado	1.506
Minnesota	1.250
Montana	1.178
Wisconsin	1.082
Illinois	1.054
North Dakota	0.820
Virginia	0.816
Kansas	0.786
West Virginia	0.760
Total 14 states	1.266

Table III. As compared with Table II, shifts take place in the positions of the four lowest states. Two of the states, Massachusetts and Rhode Island, have reached a point where if the years of completed normal-school or college courses were distributed evenly among the teachers, there would be two to each teacher. In four states the average training is less than one year per teacher. Among 180,000 teachers in fourteen states the average training is one and a quarter years.

Essentially a Rural Problem

With the figures in this simplified form it is possible to examine a number of relationships by means of the Pearson coefficient of correlation. The coefficients are given in Table IV. The probable errors of these coefficients are not given, as they would be in ordinary conventional practice. There are two reasons for this. The first is that the number of cases is too restricted. The second

TABLE IV. CORRELATIONS BETWEEN INDEX NUMBERS OF TEACHER PREPARATION AND RELATED FACTORS IN FOURTEEN STATES

Related Factor	Coefficient of Correlation
Percent of population which is urban(*a*)	0.89
Annual salaries of teachers(*b*)	0.77
Percent high-school attendance was of total attendance(*b*)	0.66
Five educational elements of Ayres' Index Number(*c*)	0.68
Five financial elements of Ayres' Index Number(*c*)	0.34
Ayres Index Number(*c*)	0.44

(*a*) Figures from 1910 census showing percent of population in cities or towns of 2,500 population or over.

(*b*) *Report of the commissioner of education on the statistics of state school systems, 1917-1918.*

(*c*) Ayres, Leonard P., *An index number for state school systems*. New York: Russell Sage Foundation, 1920.

and more important reason is that these fourteen states do not constitute a random sampling from a very much larger number of states which might theoretically be brought into the computations by future successive samplings. In theory, the use of the probable error as a measure for determining the reliability of a coefficient of correlation rests on the condition that the data used are

a truly random sampling from an infinitely great, or at least exceedingly great body of possibly obtainable data. Since there are only forty-eight states in all, and since the fourteen states here used are a selected sampling rather than a random one, the conditions requisite for utilizing the device of the probable error do not obtain. The most notable feature of Table IV is the exceptionally high correlation between teacher preparation and the percent of the population of the state which is urban.. This correlation is considerably higher than that between salaries and training. The two factors of inaccessibility of training institutions to the country girl, and unwillingness on the part of the trained teacher to go to the country school are evidently even stronger influences than amount of salary. If praise or blame were to be administered on the basis of the standing of the states in teacher preparation, the close relationship between a state's standing in this respect and the proportion of its population who are in the cities should not be overlooked.

It is apparently true that teacher preparation is more affected by the conditions of rural life than almost any other factor of school administration. The coefficient of correlation between the Ayres Index Number and the percent of the population which is urban is only 0.37. Between the five educational elements of the index number and the percent of the population which is urban there is a much closer relationship, expressed by the Pearson coefficient 0.71. Even here the relationship is not as close as that just noted with teacher preparation.

Further interesting evidence of the contrast between city and country in teacher preparation is found in a comparison of the figures of this study with those recently gathered from 359 cities of 8,000 or more population by the American City Bureau.[7] The comparison is made in Table V. In order to bring the figures to a roughly comparable basis it has been assumed that six or seven years of education beyond elementary school as recorded in the American City Bureau study is the equivalent of normal-school graduation and that eight or more years is the equivalent of college graduation. The 359 cities are representative of all parts of the United States.

[7] *Know and help your schools.* New York: American City Bureau, 1920.

TABLE V. PREPARATION OF TEACHERS IN CITIES AND IN ENTIRE STATES

Study	Number of Teachers	Percent College Graduates	Percent Normal-School Graduates	Percent with Less Training	Index Number
359 cities 1920	68,336	21.1	52.2	26.7	1.838
14 states 1918	180,394	14.2	34.9	50.9	1.266

The figures for cities clearly indicate that the typical city teacher is a trained teacher. Nearly three-quarters of those for whom the facts were ascertained were either college or normal-school graduates. These facts are especially notable because of the extended term of service of city teachers. The present teaching force is not the product of our present college, normal, and city-training school equipment; for the median teaching experience of teachers in these cities is just short of ten years and 30 percent have taught for fifteen or more years.

The fourteen states for which figures have been presented show on the average a population 50 percent urban. The figures for training in the rural districts must, therefore, be truly low to bring the state records so much under the city records. Unfortunately the rural figures are not carried separately in many of the states; so that an exact comparison is not possible.

Teacher Preparation and the Ayres Index Number

The figures of Table IV indicate that index numbers for teacher preparation correlate highly with the educational elements of the Ayres index number. That is the Ayres number while it does not measure teacher preparation directly, does do so to a certain extent indirectly. The correlations between teacher preparation and the five financial elements, and the total index are much less high. We may say that teacher preparation is a phase of school efficiency which runs in the same general direction as the various elements of the Ayres index number but is nevertheless distinct in its importance and significance. It is clear that figures on teacher preparation would be a valuable addition to the measures entering into the index number for state school systems. This

is only another way of saying that they are figures which might well be gathered every year on a uniform basis by the United States Bureau of Education.

Summary

1. At least fourteen states have published in their school reports figures for the education of teachers in service but the records of different states have not heretofore been compared nor have computations been made to measure the progress from year to year.

2. A comparison of the records of fourteen states for 1918 indicates that Massachusetts has the largest percent of trained teachers. The eastern states in general show high records and the southern and middle western states lower records. Of 180,000 teachers in fourteen states practically half were college or normal-school graduates.

3. From data for college and normal-school graduates in teaching service it is possible to compute for any state a single index number for teacher preparation for any year.

4. Coefficients of correlation between index numbers for teacher preparation and other related factors indicate that more widespread teacher preparation is predominantly a rural problem. The states which have the largest rural populations have the most poorly trained teachers.

5. Figures on teacher preparation could with profit be added to the reports compiled by the United States Bureau of Education, and would, if they were accurately compiled, be a desirable addition to the data entering into the Ayres index number for state school systems.

MANUAL ARTS BASED ON HOME REPAIR

LOGAN R. FULLER
District Vocational Officer, Federal Board for Vocational Education, New Orleans, Louisiana

This study was undertaken to determine what problems and processes would be involved in a manual arts course, based upon work which is done or may be done around the home by a handy man with a common carpenter's and painter's tools. The problems of investigation were: first, to discover the jobs; second, to list and classify them; and third, to determine what processes were involved.

THE JOBS

The method of procedure in the investigation was as follows:

1. By personal interviews with fifty people, I made a preliminary list of the things which they in their own experience had had to do or have done about the house. These people consisted of housewives of Columbia, Missouri, school teachers from various sections of the state who were attending summer school, real estate and rental men of Columbia, and business men. In conducting these interviews I explained what I wanted and asked the people to take twenty or thirty minutes to go into the matter in detail. At first I helped a little by asking if this or that had ever needed repairing and usually they took great pains to recall everything. When we had gone as far as we could, I asked specifically about other things which was mentioned previously by some one.

2. I supplemented these interviews by personal inspection of twelve houses—in many cases the dwellings of the people I had interviewed. Using a list of two hundred items, I made a complete survey, in a small rural community of Missouri, of the problems of household construction and repair. In this way I reached the point where additional inspection or additional conversation added only an occasional item to the list.

3. All the items were then grouped under general headings of painting, furniture repair, house repair in general, house repair inside, doors, windows, screens, general repair, shoe repair, sharpening, plumbing and metal work, and new things made for the house. In all there were 328 items. These were printed with the following directions. (The first section in painting is also included to show the form used.)

DIRECTIONS

Name.....City.....Date.....

Have you had any work in Manual Training?.....

Our purpose

To find out what has to be done about the house, the doing of which requires the use of tools.

What you are asked to do

First: Examine carefully the following lists of things which are suggested as possible things to be done.

Second: Take the list and with the help of your parents or the landlady examine the house in which you live. Underscore all things which need to be done. Also underscore all things which you, your parents, or landlady recall have been done in this house or any other house with which you, or they, have been acquainted.

Third: Write in the blank space provided all those things which need to be done or have been done, which are not found in this list. This is especially important, as we wish to make this list as complete as possible.

Fourth: Please fill this out tonight. Mark as directed above. Have sheets fastened together. *Bring them to your first class tomorrow.* Lay them on the teacher's desk as you enter.

Painting

Paint house, paint outbuildings, paint repairs, paint screens, paint interior woodwork, paint floor, paint gutter, paint tin roof, tint walls, enamel bed, varnish furniture, stain furniture, patch scarred varnish, remove varnish, varnish woodwork, varnish floors, shellac floors, oil floors, wax floors, clean and oil furniture, polish furniture, apply wood filler.

These questionnaires were presented in person to the students at assemblies in the Columbia High School, the University High School, and to the college students in the university shops. In all 430 blanks were used and returned. The frequency of mention of each job was then determined.

Assuming for purposes of study that these jobs would determine the content of a manual arts course, two alternatives presented themselves. First, the course might be taught as a project or home-project course, and the students might be given the jobs to do at home or in the shop. Or, second, the tool processes necessary to perform these jobs might be drawn off the jobs and the tool processes might be taught systematically or by the problem method. Of these two the second alternative was selected; and a type of analysis is shown in Table II.

TABLE I. THE 54 JOBS WITH A FREQUENCY OF MENTION OF 150 OR OVER. CLASSIFIED ACCORDING TO TYPE OF JOB

Rank	Frequency	Job	Rank	Frequency	Job
		PAINTING			PUT HANDLE IN TOOLS
1	271	Paint house	36	169	Rake
5	222	Paint floors	39	163	Hammer
7	219	Paint screens	41	161	Ax
9	211	Paint outbuildings	50	152	Hatchet
13	197	Paint interior woodwork			
11	208	Varnish furniture			SHARPEN TOOLS
43	157	Varnish woodwork	2	253	Knives
45	156	Varnish floors	4	224	Scissors
27	183	Polish furniture	9	211	Skates
48	154	Clean and oil furniture	14	195	Ax
31	176	Wax floors	49	153	Lawn mower
		FURNITURE REPAIR			PLUMBING
7	219	Tighten screws in furniture	31	176	Stop leaks in faucets
16	194	Put knob on drawer	41	161	Thaw frozen pipes
33	171	Tighten belt on sewing machine	48	154	Clean oil stove
36	169	Clean and adjust sewing machine			GENERAL REPAIR
52	151	Reseat chair	4	224	Put up clothes line
			11	208	Paper room
		SCREEN REPAIR	16	194	Mend locks
12	198	Make fly swatter	18	193	Re-putty glass
16	194	Put new wire on old frames	20	190	Build fence
			20	190	Hang shades
24	188	Put new spring on screen door	20	190	Plane tight door
			23	189	Stop rat holes
26	184	Rehang screen door	23	189	Build chicken coop
37	167	Put new hook on screen door	26	184	Make hen's nest
			28	182	Fit and lay linoleum
45	156	Screen in porch	29	177	Make swing
45	156	Hang window screens	32	172	Put shelves in closet
52	151	Mend torn screen wire	34	170	Make sled
			38	165	Set fence posts
			41	161	Mend window shades
			52	151	Set glass
			54	150	Make yard gate

This table should be read as follows: Painting the house ranked first in frequency and was mentioned 271 times.

The eleven highest frequencies were: painting the house (271); sharpening knives (253); sharpening scissors (224); putting up clothes lines (224); painting floors (222); painting screens (219); tightening screws in furniture (219); painting outbuilding (211); sharpening skates (211); varnishing furniture (208); and papering rooms (208).

TABLE II. DETERMINING THE TOOL PROCESSES

A. Tool Processes Used in Woodwork				B. Processes Other than Woodworking Used in the 54 Projects			
Number	Process	Number	Process	Number	Process	Number	Process
1	Planing	17	Laying-out	33	Plumbing or leveling	47	Cutting glass
2	Scoring	18	Chamfering	34	Scribing to irregular service	48	Fastening with glazer-points
3	Sawing	19	Beveling	35	Stapling	49	Applying putty
4	Boring	20	Modeling	36	Mixing paint	50	Puttying nails, staples, tacks
5	Sandpapering	21	Carving	37	Puttying holes	51	Removing old wall paper
6	Scraping	22	Mortising	38	Filling	52	Mixing paste
7	Bowsawing	23	Mitering	39	Applying paint	53	Cutting paper
8	Gauging	24	Fitting	40	Removing paint	54	Applying paste
9	Nailing	25	Superposing	41	Applying varnish	55	Hanging paper
10	Screwing	26	Doweling	42	Removing varnish	56	Brushing paper smooth
11	Glueing	27	Inlaying	43	Polishing	57	Tinkering—(general adjusting not reducible to processes)
12	Countersinking	28	Assembling	44	Applying wax		
13	Spokeshaving	29	Dadoing	45	Digging postholes		
14	Chiseling	30	Grinding	46	Setting posts in ground		
15	Gouging	31	Whetting				
16	Finishing	32	Filing				

TABLE III. PROCESSES USED IN 54 JOBS OF HIGHEST FREQUENCY[a]

Rank	Frequency	Job	Process by Number (Table II)
1	271	Paint house	36, 37, 38, 39, 40
2	253	Sharpen knife	30, 31
4	224	Sharpen scissors	30, 31, 32
4	224	Put up clothes line	57, 35, 9, 45, 46
5	222	Paint floor	36, 37, 38, 39, 40
7	219	Paint screen	36, 39
7	219	Tighten screws in furniture	10
9	211	Paint outbuilding	36, 37, 38, 39, 40
9	211	Sharpen skates	30, 32
11	208	Varnish furniture	41, 42, 43
11	208	Paper room	51, 52, 53, 54, 55, 56
12	198	Make fly swatter	1, 3, 5, 9
13	197	Paint interior woodwork	36, 37, 38, 40
14	195	Sharpen ax	30, 31
16	194	Put knob on drawer	10, 57, 4
16	194	Put new screen wire on frames	9, 35, 57
16	194	Mend locks	57, 32, 10
18	193	Reputty glass	48, 49
20	190	Build fence	9, 3, 45, 46, 57
20	190	Hang shades	10, 57, 25
20	190	Plane tight door	10, 1, 25, 34
23	189	Stop rat holes	9, 57
23	189	Build chicken-coop	1, 3, 9, 28, 35
24	188	Put new spring on screen door	10, 57
26	184	Rehang screen door	1, 10, 57
26	184	Make hens' nest	1, 3, 9, 24, 28
27	183	Polish furniture	43
28	182	Fit and lay linoleum	34, 2, 17, 24 [18, 24, 25, 28
29	177	Make swing	1, 2, 3, 4, 5, 9, 10, 14, 16, 17, 44, 43
31	176	Wax floor	10, 57, 24
31	176	Stop leak in faucet	1, 2, 3, 24
32	172	Put shelf in closet	57 [22, 25, 28, 24
33	171	Tighten belt on sewing machine	1, 2, 3, 4, 7, 9, 10, 13, 14, 17,
34	170	Make sled	10, 57
36	169	Clean, adjust sewing machine	57, 13, 6, 24
36	169	Put handle in rake	10, 57
37	167	Put new hook on screen door	45, 46
38	165	Set fence post	3, 6, 13, 24, 57
39	163	Put handle in hammer	3, 6, 13, 24, 57
41	161	Put handle in ax	57
41	161	Thaw frozen pipes	57, 9
41	161	Mend window shades	38, 42, 41, 43
43	157	Varnish woodwork	9, 17, 28, 57
45	156	Screen porch	42
45	156	Varnish floors	1, 3, 9, 10
45	156	Hang window screen	57
48	154	Clean oil stove	57, 43
48	154	Clean and oil furniture	30, 32
49	153	Sharpen lawn mower	57, 13, 6, 24
50	152	Put handle in hatchet	57
52	151	Mend torn screen wire	9, 10, 24, 25
52	151	Reseat chair	47, 48, 49
52	151	Set glass	1, 2, 3, 9, 10, 14, 17, 24, 28
54	150	Make yard gate	

(a) In ranking, when two jobs had the same frequency both were given the lower rank and the higher omitted; when three jobs had the same frequency the middle rank was used

TABLE IV. FREQUENCY OF THE PROCESSES INVOLVED IN THE REPAIR JOBS LISTED IN TABLE I

Rank	Job	Frequency	Rank	Job	Frequency
1	Planing	10	31	Whetting	3
2	Scoring	5	32	Filing	4
3	Sawing	11	33	Plumbing or leveling	0
4	Boring	3	34	Scribing	2
5	Sandpapering	3	35	Stapling	3
6	Scraping	4	36	Mixing paint	6
7	Bowsawing	1	37	Puttying holes	4
8	Gauging	1	38	Filling	5
9	Nailing	14	39	Applying paint	5
10	Screwing	15	40	Removing paint	4
11	Gluing	0	41	Rubbing varnish	2
12	Countersinking	0	42	Flowing varnish	3
13	Spokeshaving	5	43	Polishing	5
14	Chiseling	3	44	Applying wax	1
15	Gouging	0	45	Dig posthole	3
16	Finishing	1	46	Set posts in ground	3
17	Laying-out	5	47	Cutting glass	1
18	Chamfering	1	48	Fastening with glazer-points	2
19	Beveling	0	49	Applying putty	2
20	Modeling	0	50	Putting nails, etc.	0
21	Carving	0	51	Remove old wall paper	1
22	Mortising	1	52	Mix paste	1
23	Mitering	0	53	Cut paper	1
24	Fitting	12	54	Apply paste	1
25	Superposing	5	55	Hang paper	1
26	Doweling	0	56	Brush smooth	1
27	Inlaying	0	57	Tinkering (general adjusting not reducible to processes)	23
28	Assembling	6			
29	Dadoing	0			
30	Grinding	5			

In Table II a standard is found for judging the practical value of the common manual arts course for the communities studied. That there is little similarity between the two is remarkably clear. As one runs over the list it is noticeable that less than half the processes are taught either as projects or in elementary form in the present courses. However, this study was made not as a protest against alleged weaknesses of the common course but in a spirit of curiosity to see how such a course would appear. If

home repair and construction were the objective of the manual arts course then the present course would need to be radically changed. For instance, in painting a house processes numbers 36, 37, 38, 39, and 40 are used. These are mixing paint, puttying holes, filling, applying paint, and removing paint.

In Table III are shown the processes involved in performing the 54 jobs listed in Table I. In order that all processes listed be determined, all the jobs are analyzed in terms of processes not only of woodworking, but also of painting, etc.

When these have been derived it is possible to determine the relative frequency of each process. This has been done in Table IV, which shows that planing occurs ten times in the 54 jobs. Upon such a basis it would be possible to determine the more or less commonly used processes so that relative emphasis might be determined. It should be noted that the first 31 processes are those commonly taught in school shops. The remainder are not usually found in any manual arts course now in use. It is apparent that if home repair and construction be made the basis for a course in manual arts, it is not necessary to use the project method. For once the processes have been derived, it is a matter of choice as to whether they be taught systematically and in isolation from practical jobs as projects at home or as problems in the shop. The important point to bear in mind is that it is entirely practicable to draw off the processes from home projects and determine which of them to teach and emphasize.

THE DEVELOPMENT OF A CHART FOR ATTAINMENTS IN READING

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In an address before the teachers of the Rochester public schools, Dr. William S. Gray of the University of Chicago declared that there was a lack of uniformity in our aims in reading. Reflecting on this statement, we concluded that this lack of uniformity in *aims* in reading, if it really existed, would be likely to have a bearing on *attainments* in reading. Accordingly, we decided to ask each teacher in the elementary schools to state the three chief aims in reading.

When these replies had been tabulated it was perfectly evident that Dr. Gray was right. The replies brought forth, grade by grade, a great many vague and indefinite statements. One teacher, for example, gave the following as a legitimate first-grade aim in reading: "To lay the cornerstone of all education." On the whole, however, we received a body of material worth putting into definite shape for a report back to the teachers. This led us to ask the teachers for a restatement of their aims after they had made a careful study of the first tabulation. The second set of replies was a decided improvement over the first. After again sending back a tabulation, a third request brought a body of material which was organized by a committee of teachers into grades and divisions. The result was a reading chart to which we have given the title "Attainments in Reading." The material contained in the chart is reproduced in connection with this article.

The process by which this chart was built up covered practically two years. During this time the Gray tests in reading were given in different schools; and the results were reported to teachers through institutes and conferences, and through printed articles in the *State Teachers' Journal*. The measurement work showed beyond doubt that the teaching of silent reading was deficient. This led to a more serious study of the problem of reading on the part of the whole teaching force.

Hitherto stress had been laid on oral reading attainment. The tests revealed that practically no special attention was being

given to the matter of correct "interpretation" of the material read. Children could read orally satisfactorily, but they were not being encouraged to look for the "central thought." They were not required to "reproduce" the subject matter of the text nor to show whether or not the "author's aim" had been sensed. Although the proper mastery of arithmetic, geography, and history is based directly on this ability to grasp the central thought, to understand the author's aim, and to reproduce, no general effect was being made to show the pupils the relationship existing between good reading and good marks in arithmetic, geography, and history. In other words, no definite attempt was being made in our schools to train the children in "effective study habits."

When it was brought home to us that reading was not just an isolated subject in our curriculum but was closely related to every other subject, we realized that an improvement in reading would bring about a corresponding improvement in the related subjects. This being true, the next step was to determine just how this improvement in reading ability could best be attained. In his talk to the Rochester teachers in 1919 Dr. Gray said:

> The results of studies of the acquisition of reading ability enable supervisors and teachers to reach certain conclusions in regard to the aims of certain grades. First, emphasis should be placed on the content of what is read in each grade. Second, the first three grades should be devoted largely to the attainment of a high degree of fluency in oral reading. Third, some attention should be given to problems of silent reading during the primary grades. Habits of effective silent study should receive large attention during the fourth, fifth, and sixth grades. Fourth, ability to make keen, critical interpretation of what is read should be emphasized in the sixth, seventh, and eighth grades.

This, briefly, is what we are now trying to do in Rochester. The final threshing out of the aims suggested by the teachers resulted in four clear-cut statements essentially the same as those given above by Dr. Gray. In the form of the chart as actually placed in the hands of the teachers these were entered in the left-hand column under the general caption "Reading Results." To the right of each statement of aim and under the proper grade designation were given specific directions for accomplishing the aim. Thus the chart is not a group of *suggestions*, but an actual course of study; and it has been officially adopted as such by the board of education. In order that the reader may obtain a correct idea

of the organization of the chart, an outline of it is presented in Figure 1.

FIGURE 1

ATTAINMENTS IN READING

READING RESULTS	KINDERGARTEN-PRIMARY GRADES			ELEMENTARY GRADES		
	KINDERGARTEN	FIRST GRADE	SECOND AND THIRD GRADES	FOURTH GRADE	FIFTH GRADE	SIXTH GRADE
I PERMANENT INTERESTS IN READING						
II ECONOMICAL AND EFFECTIVE STUDY HABITS						
III ECONOMICAL AND EFFECTIVE USE OF BOOKS						
IV THOROUGH MASTERY OF THE MECHANICS OF READING						

In the form of the chart here presented each of the statements of aims is given above the items bearing on the attainment of these results in each grade. The four statements are: (I) permanent interest in reading, (II) economical and effective study habits, (III) economical and effective use of books, (IV) thorough mastery of the mechanics of reading. With respect to "economical and effective study habits" the attention of teachers is called in the chart to Dr. Gray's statement:

> I consider that teaching pupils to study is a fundamental part of the problem of teaching pupils to read. The various habits of study which should be emphasized correspond to the study problems in all the content subjects as well as in the study of literary selections. The suggestions concerning study habits in the fourth, fifth, and sixth grades are gathered largely from a study of the uses which pupils are required to make of reading ability in the preparation of reading assignments.

ATTAINMENTS IN READING

I. PERMANENT INTERESTS IN READING

A. CURRENT EVENTS—(1) *Newspapers;* (2) *Magazines.*

B. BOOKS OF REAL WORTH—(1) *Fiction;* (2) *Poetry;* (3) *History;* (4) *Science;* (5) *Biography;* (6) *Travel.*

Kindergarten

1. Tell and occasionally read interesting stories and poems.
2. Read simple poems and ask children to give content.
3. In dramatizing simple rhymes and stories use printed cards to designate objects and characters.

4. Encourage children to observe street signs, billboard advertisements, etc.
5. Read from story books brought from home by children.
6. Encourage children to make simple booklets containing pictures under which teacher may print title suggested by child.

First Grade

1. Make simple printed sheets about a common experience, etc. Call this a newspaper to bring use of newspaper before children.
2. Reserve portion of blackboard to be designated as Bulletin Board. Print here simple directions for the day or simple notices of special occasions.
3. Have children memorize good short poems.
4. Use primer the content of which is interesting and worth while from a literary standpoint.

Second and Third Grades

1. Short talks on current events with reference made to newspapers and magazines.
2. Select books with interesting content and good literature. Call attention to authors, illustrators, etc.
3. Direct attention to interesting books to read independently.
4. Have children interpret and memorize poems.
5. Arouse a desire to read by telling part of a story. Let children tell how it might end and then read remainder of story.
6. Have many sets of interesting books for children to read.
7. Have supplementary books that may be taken home.
8. Encourage children to bring their own books to be used as a library.
9. Encourage supplementary reading when work is finished.

Fourth Grade

1. See suggestions for second and third grades.
2. Discuss, in a very simple way, current events. Have pupils bring to class clippings from newspapers and magazines on various topics.
3. Encourage drawing books from public library for project reading.
4. Encourage reading aloud to parents or friends.
5. Encourage much silent reading at home for pleasure. Keep in touch with what pupils are reading by class discussions of interesting books pupils have read.
6. Arouse interest in the reading of poetry by reading aloud best literary selections to class. Follow this by discussion.
7. Interest pupils in good literature by reading to class a chapter or two of some good book and then give them an opportunity to finish the book independently.

Fifth Grade

1. See suggestions for previous grades.
2. Discuss current events. Have pupils bring to class clippings from newspapers and magazines on projects being studied.

3. Encourage drawing books from the public library for project reading.
4. Keep a record for the grade, showing title and author of all books read during the semester.
5. Encourage oral reading at home to give others pleasure.
6. Assign to individual pupils interesting short stories to be read at home for the purpose of telling to the class.
7. Assign poem to entire class for silent reading. Then select several children to read stanza which they have enjoyed.
8. Arouse desire to read good literature by interesting the class in one of the great writers. Encourage a search on the part of the individual pupils to see who can read the greatest number of selections by this author. Pupils keep individual list of selections or books read.

Sixth Grade

1. See suggestions for previous grades.
2. Discuss current events. Elaborate upon fourth and fifth grade work by having pupils make individual collection of newspaper clippings and magazine articles which pertain to projects being studied in geography, history, etc.
3. Stimulate interest in reading library books by each month writing on the board a list of several worth while books for the children to read independently.
4. Keep several interesting books upon a reading table and permit individual pupils to read these whenever other work is finished. Frequently add new books and call attention of class to them.
5. Develop the habit of pupil's keeping an individual record of all books, short stories, poems, magazine articles, etc., read. Insist upon exact title, author and source being noted. Contests will stimulate this work.
6. Begin a more intensive study of poems, by helping the pupils to recognize and appreciate the various pictures or ideas which the poem aims to convey.

II. ECONOMICAL AND EFFECTIVE STUDY HABITS

A. ANALYSIS—(1) *Central thought;* (2) *Author's aim;* (3) *Characters;* (4) *Problems.*

B. CORRELATION—(1) *With previous experience and reading;* (2) *With similar material.*

C. JUDGMENT—(1) *Value;* (2) *Validity.*

D. INTERPRETATION.

E. REPRODUCTION.

Kindergarten

1. Interest pupil in reading as a thought process, through incidental reading such as looking over shoulder while teacher reads.
2. Have children reproduce poem or story in their own words.
3. Teacher or child repeat rhyme which has been memorized and a child or entire group supply rhyming words.

4. Teacher read story already familiar to the children. Stop at frequent intervals and have children tell the next thing that happened.

First Grade

1. Give special attention to content of what is read.
2. Have children pick out words, phrases or groups of words from the sentences.
3. Have children read nursery rhymes and familiar short stories to gain power in reproducing the thought.
4. For thought getting, have children reproduce what has been read the previous day.
5. Have children read silently with the idea of telling the story to the class.
6. Have children relate materials read to previous experience.
7. Have children follow accurately either printed or written directions.
8. Lead children to find important idea or ideas of a selection.
9. Have children read questions silently and give answers orally.
10. Write brief descriptive sentences about a pupil and have children guess who is described
11. Ask questions about thought unit or page that has been read silently.
12. Give dramatization and picture study a prominent place in thought getting.
13. Lead children to observe sequence of important ideas.

Second and Third Grades

1. Lead children to find answers to simple problems, later to more difficult ones.
2. Have children relate materials read to previous experience.
3. Have children follow accurately either printed or written directions.
4. Lead children to find important idea or ideas of a selection.
5. Lead children to find a series of closely related points.
6. Develop attitude and habit of looking for meanings in all reading exercises:

   NOTE:—Put questions on the board and have children read to find answers to questions. Let children question each other on a selection which has been read. Let children tell meaning of words by giving other words that could be used instead. Children should be able to answer **accurately** any questions after **one** reading of a simple selection.
7. Train children to remember and reproduce.
8. Have children suggest appropriate titles for a story or for various parts of a story.
9. Develop the habit of finding simple quotations.
10. Lead children to find the central thought.
11. Lead children to find descriptions.
12. Have the children find the part of selection which gives most knowledge of a certain character.
13. Have children find elements of time and place.
14. Have children compare characters in stories to those in life. Have them select chief characters and minor characters.

15. Give dramatization of stories a prominent place in thought getting.
16. Allow children to illustrate stories with water colors, crayons, plasticine, free hand cuttings, etc.
17. Encourage children to form mental pictures of what is read. Teacher may check up on accuracy of pictures thus formed by having children describe them orally.
18. Train children to give definite questions.
19. Have children give their own interpretation of an illustration and compare with the story of the author.
20. Have children tell what they like and what they do not like in a selection and why.

Fourth Grade

1. Find the central idea in paragraphs and short selections in which points are fairly evident.
2. Find the author's aim or purpose in short selections in which the author's purpose is fairly evident. Discussions initiated by teacher.
3. Discover problems for study and investigation in connection with material which is closely related to interesting problems for study. Teacher asks questions.
4. Find a series of closely related points in short selections in which the points are fairly evident. Teacher writes points on board as they are selected.
5. Determine the relative importance of statements in regular reading material. Teacher directs discussions to proper conclusions, laying foundation for independent judgments.
6. Associate material read with previous experience in selections containing much material related to pupils' immediate experiences. Pupils encouraged to report their experiences.
7. Find answers to thought-provoking questions which are asked by pupils or teacher in relatively easy assigned passages. Answers derived directly from content.
8. Select facts which relate to a problem under discussion in relatively easy assigned passages. Problem suggested by pupils or assigned by teacher. Pupils search for facts which bear directly on problem. Each pupil recognizes why decisions are good or poor.
9. Draw valid conclusions from material read in relatively simple selections. Problem assigned by teacher. Reasons for conclusions carefully explained.
10. Judge the validity of statements in material which presents statements the validity of which might be questioned. Teacher challenges statements and recalls statements or experiences which are at variance with those read. Lays foundation for a critical attitude.
11. Remember and reproduce short selections containing narrative and descriptive material.
12. Train in keen critical interpretations of simple material in which interpretations are based on pupils' experiences, previous reading, on

meanings derived from a study of the context, the dictionary, or notes and explanations in the books used by pupils. Teacher directs and supervises closely.

13. Dramatize informally short stories.

Fifth Grade

1. Find the central idea in more difficult paragraphs and selections, careful weighing of values necessary to select the most important idea.
2. Find the author's aim or purpose in longer and more difficult selections. Responsibility imposed on pupils for decisions.
3. Discover problems for study and investigation in connection with assigned material in various subjects. Pupils required to discover correlated topics or problems.
4. Find a series of closely related points in longer and more difficult selections in which the points are not so evident. Pupils select independently. Form of organization considered.
5. Determine the relative importance of statements in regular reading material. Pupils required to distinguish independently between the important and unimportant in well organized selections.
6. Associate material read with previous experience in selections normally read by the class. Pupils required to search independently for related experiences and to explain author's meanings in terms of their own experience.
7. Find answers to thought-provoking questions which are asked by pupils or teacher in more difficult assigned material. Answers derived through thoughtful consideration of content; in assigned material from several sources.
8. Select facts which relate to a problem under discussion in relatively difficult assigned passages and in material from various sources. Pupils trained to differentiate carefully between that which does and that which does not relate to the problem in hand.
9. Draw valid conclusions from material read in selected material normally read by the class. Responsibility placed on class to weigh values and to support conclusions.
10. Judge the validity of statements in material which presents conflicting statements. Responsibility placed on pupils to discover such discrepancies. Evidence supporting each point of view carefully considered. Teacher refers class to an authoritative statement.
11. Remember and reproduce longer selections in which some selection and reorganization are necessary to meet the requirements of the assignment.
12. Train in keen, critical interpretations of more difficult material in which considerable thinking is necessary to reach valid conclusions. Problems assigned by teacher. Responsibility imposed on pupils to look up necessary facts and to draw conclusions.
13. Dramatize informally longer stories.

Sixth Grade

1. Find the central idea in still more difficult paragraphs and long stories. Careful analysis and clear thinking required.
2. Find the author's aim or purpose in all types of selections ordinarily assigned. Judgment of pupils refined by estimating extent to which author realized his purpose.
3. Discover problems for study and investigation in connection with content subjects. Pupils given opportunity to read for a day or two to discover problems which should be studied in connection with a given topic.
4. Find a series of closely related points in difficult selections and material drawn from several sources. Statements carefully worded. Relationships clearly indicated by form of organization.
5. Determine the relative importance of statements in more or less difficult material. Pupils required to discuss relative values freely and to criticize the organization and relative value of various parts of assigned material.
6. Associate material read with previous experience in selections containing references to various fields such as history, geography, nature study, etc. Relationship to these general fields recognized and brought out by pupils.
7. Find answers to thought-provoking questions which are asked by pupils or teacher in relatively difficult selections; in material from various sources selected in part by pupils.
8. Select facts which relate to a problem under discussion in difficult passages and in material selected independently by the pupils. This requires training in looking up topics in textbooks and books of reference.
9. Draw valid conclusions from material read in difficult selections and material drawn from various sources. Pupils required to state conclusions and to give evidence which supports them.
10. Judge the validity of statements in all material read. Critical attitude encouraged. Pupils trained in the various types of source material in determining the validity of statements.
11. Remember and produce material from several sources, organized and put in form for a coherent, clear-cut presentation.
12. Train in keen, critical interpretations of difficult material. Pupils trained to distinguish between passages which need careful study and those which do not. Special training provided in the use of appropriate helps and in keen interpretations of materials.
13. Dramatize selections or single chapters from any long selection. Make definite assignments for home reading to groups of pupils in order that they may work out the necessary details for simple dramatization.
14. Discuss title. Why has author chosen title? After reading part of story let children suggest suitable titles. Show relationship between title and story.

15. Find important units of thought. Choose a name for important divisions of the story. Write name chosen, introductory and closing words. Emphasize the limits of complete thought units by requiring pupils to read to class introductory and closing words.

III. ECONOMICAL AND EFFECTIVE USE OF BOOKS

A. LIBRARY—(1) *Card index;* (2) *Reference books and indices;* (3) *Encyclopedias.*

B. HELPS—(1) *Notes;* (2) *Index;* (3) *Glossary;* (4) *Chapter headings.*

Kindergarten

1. Encourage children to bring their own attractively illustrated story books to be enjoyed by the whole group.
2. Encourage children to bring stories and pictures. These may be assembled into a booklet which might be made for first grade or for an absent member of the class.
3. Train pupils to turn pages without tearing them.

First Grade

1. Encourage children to bring alphabet books with pictures and names.
2. Develop on the board stories of a few short sentences about a common experience or descriptive stories. Afterward print these stories on sheets and have children combine into booklets.
3. Select primer with attention to content.
4. Have lessons on use, handling and care of books; proper position, how to turn pages, order of paging and exercises in finding given pages rapidly.
5. Emphasize the importance of clean hands and care in handling books.

Second and Third Grades

1. Direct attention to book, title, author, illustrator, publisher, date published, table of contents. Develop skill in finding titles in table of contents.
2. Direct attention to differences in same story as told in different books:
   NOTE:—Have silent reading of different version of a story which has been previously developed.
3. Direct attention to interesting books to be read independently, on some project or problem.
4. Complete training in finding pages quickly.

Fourth Grade

1. See suggestions for second and third grades.
2. Give instruction in use of table of contents, chapter headings, glossary, etc. Teach these points only in the most simple form.
3. Give instruction in use of several books to secure information on a given problem.
4. Give training in the economical and effective use of dictionary.

Fifth Grade

1. See suggestions for previous grades.
2. Emphasize use of several reference books and various source material.
3. Insist upon pupils locating all topics by aid of table of contents or index.
4. Call frequent attention to the help to be gained by careful study of paragraph headings.
5. Train pupils to use supplementary list of words in back part of dictionary.

Sixth Grade

1. See suggestions for previous grades.
2. Give instruction in use of encyclopedia. This should be of simple character.
3. Arrange with librarian for class to visit school or public library for the purpose of studying the use of card index.
4. Develop habit of evaluating material to be used in preparing assignments by aid of table of contents, index, chapter and paragraph headings.
5. Teach meaning and use of foot note, marginal note and cross reference if discovered in any material studied.

IV. THOROUGH MASTERY OF THE MECHANICS OF READING

A. SILENT READING—(1) *Comprehension;* (2) *Rate.*
B. ORAL READING—(1) *Word Mastery;* (2) *Phonetic analysis;* (3) *Fluency.*

Kindergarten

A. Silent Reading

1. Teach children to recognize their own names.
2. Place the children's dictated ideas on the board.
3. Lead children to see that different symbols have different meanings. (A) By noticing street and car signs, etc., when out for a walk. (B) By looking at picture books, etc., in the room.
4. Label articles of furniture, pictures, etc., with their names.

B. Oral Reading

1. Using "A, B, C" books with large type, have children find words and letters that are alike.
2. Have children tell words that begin with the same sound or have the same ending.
3. Get vocabulary from the first grade teacher and use in conversation.
4. Use games with cards on which are written the names of the days, months, members of the family, etc.
5. Organize vocabulary common to group at beginning of semester. To this add from time to time new words.
6. To increase vocabulary the teacher may bring new words to the attention of the child by constant repetition in conversation. The child absorbs them unconsciously.

First Grade

A. Silent Reading

1. Have some silent reading. This may be rereading of a story previously read to find answers to questions, or it may be another version of the same story in order to find differences.
2. Have pupils reread silently story previously read or some story in a new version to gain fluency and better rate.
3. Give children questions printed on slips to be read silently and answered orally.
4. Have short stories (with pictures) pasted on cards to be read silently and told in child's own words.

B. Oral Reading

1. Give children newspaper clippings and have children underscore familiar words.
2. Use flash card exercises, short phrases and action sentences.
3. Write sentences on the board, one shown at a time, short exposure.
4. Have oral reading that children may connect known word with printed symbol. Reading for thought not pronunciation of words and enunciation.
5. Have exercises to overcome the tendency to detach the articles "a," "an," "the" from the noun.
6. Secure Word Mastery through:—
   (a) Aid of comparison—i. e. Matched with word under known picture or word known in committed sentence.
   (b) Knowledge of meaning of sentence—words recognized through resemblance to known words.
   (c) Words recognized at sight.
   (d) Unfamiliar words recognized through phonetic analysis.

Second and Third Grades

A. Silent Reading

1. Provide for extensive reading of simple selections to gain rate and span of recognition.
2. Rapid reading of simple, easy material should very often be done under timed conditions.
3. Give small amount of silent reading on projects or to gather material for dramatization.
4. Encourage either oral or silent reading just for pleasure.

B. Oral Reading

1. Make word books in preparation for dictionary work.
2. Encourage children to report new words found in outside reading.
3. Have children make lists of certain kinds of words as: "time words," "place words," "descriptive words," etc.
4. Drill to emphasize importance of words commonly confused, such as "when and then," "saw and was." Show how carelessness in looking at these may change the meaning of a sentence or paragraph.

5. Continue word drill and phonetic analysis of monosyllabic words with opportunity provided for application.
6. Develop accuracy and independence in word recognition.
7. Finish phonetic analysis of monosyllabic words and lay foundation for polysyllabic words.
8. Complete flash card exercises of longer phrases and sentences.
9. Complete essential training in fundamentals of oral reading with naturalness of expression.
10. Have oral reading in real audience situation to gain ability to read clearly and effectively.

Fourth Grade

A. Silent Reading

1. Have at least half of the reading silent reading.
2. Have silent reading on projects in connection with history, geography, etc.
3. Give opportunity for quantitative silent reading with special instruction in the art of effective silent reading.
4. Allow children to read easy, interesting stories for short period, securing rhythmical sweeps with few fixations as child is absorbed in story.
5. Give speed drills in reading for thought. Borrow supplementary readers from lower grade.
6. Encourage pupils to reread simple, familiar material. Place a time limit and see how many pupils approach the standard rate.
7. Give informal or standardized tests both for comprehension and rate. Give the class standards to be obtained and allow pupils to keep their own scores so that they may know their progress.

B. Oral Reading

1. Review phonetic rules and principles.
2. See suggestions for previous grades.
3. Drill on word analysis for content and pronunciation.
4. Give attention to syllabication and accent.
5. Begin in this grade a systematic study of the dictionary. Drill on alphabetic arrangement of words to the third letter (see Course of Study in English). Emphasize purpose of words in heavy type at top of page.
6. Develop habit of consulting dictionary for pronunciation and meaning of unfamiliar words. Show value of diacritical marks in this connection.
7. Lead children to determine meaning of unfamiliar words by context.
8. Provide audience situations for oral reading. Occasionally require a summary by individual pupils of what has been read to class.

Fifth Grade

A. Silent Reading

1. See suggestions for previous grades.
2. Increase amount of silent reading to about ratio of 60 to 40.
3. Extend time for reading interesting stories to secure better rate.

4. Provide opportunity for silent reading from several books for the purpose of collecting information in connection with some project being studied.
5. Try to determine by means of informal or standardized tests the individual difficulties children encounter in silent reading.

B. Oral Reading

1. Emphasize all points noted for third and fourth grades.
2. Extend the study of the dictionary. Make daily assignments in spelling, etc., of definite words for which the dictionary should be consulted.
3. Place a greater emphasis on word analysis in derivation of meanings.
4. Encourage each pupil to keep individual lists of the meaning of all new words for which the dictionary has been consulted.
5. Continue the study of the rules of accent and syllabication. Apply rules to new polysyllabic words encountered in reading.

Sixth Grade

A. Silent Reading

1. Amplify all points noted for third, fourth and fifth grades.
2. Give special drill on any points noted for previous grades in which your individual grade seems to have difficulty.
3. Locate individual difficulties through the use of informal or standardized tests.
4. Increase amount of silent reading to about 70 to 30.
5. Motivate silent reading of reference material by definite assignments in connection with projects or problems being studied.
6. Help pupils to recognize the difference between quick reading with slight attention to details and careful, intensive reading by training them to quickly scan a paragraph or page for the purpose of deciding whether its content is worthy of careful study.

B. Oral Reading

1. Provide for special drill on any points previously noted which have not become habituated by the class.
2. Insist upon the independent use of the dictionary when needed.
3. Encourage pupils to be alert in detecting errors in their own pronunciation and generous in helping other pupils to overcome their errors.

In order to bring the matter definitely to the attention of all concerned every teacher in the system was provided with a copy of the chart for personal use and for display in the classroom. It was discussed, in detail, at the general institute held just previous to the opening of school in September, 1920; and it has subsequently been taken up at various principals' meetings. The principals have reported the results of these meetings back to their teachers. As a consequence of all this the teachers are fully alive to the situation.

Already suggestions for improvement are coming to the central office from principals and teachers. The chart is not regarded as a perfect piece of work by any means. It is to be revised next year in the light of this year's experience and many of the suggestions, now on file, will be incorporated in the next draft.

It is also planned to place not only a copy of the large chart in the hands of each teacher but also a chart of more convenient size which will contain only the general aims in reading and the specific directions for the grade in question.

The principals and teachers of Rochester have approached the problem of reading in a scientific spirit and with open minds. Good reading ability is not the cure-all for every ill, but we believe that if the children in our schools are really taught economical and effective use of books, and are helped to attain permanent reading interests, we have given them the tools with which they may work out with greater satisfaction to themselves and to us their immediate problems in arithmetic, history, and geography. To that end have we organized the "Attainments in Reading" chart.

INEQUALITY OF EDUCATIONAL OPPORTUNITY

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A STUDY OF THE SCHOOLS IN A MICHIGAN VILLAGE

We hear a great deal today about equality of educational opportunity in America. It is difficult, however, for one who devotes much time to visiting rural, village, and city schools to hear this doctrine without vigorous protest. At any rate, one is led to insist upon a distinction between equality and identity of opportunity.

Identity of opportunity means that the same opportunity is open to all pupils regardless of their abilities and interests. Equality of opportunity signifies that the pupil is offered opportunities in accordance with his abilities and interests. Accepting this distinction there is, in a very general way, identity of opportunity. But, when we consider an area as great as that of a country, even identity is apparent and not real, since one school has adequately trained teachers, another has teachers of little training; one possesses ample equipment, another has none; and one is provided with a modern, comfortable building, while another has a building unfit for school purposes. On the other hand, we have scarcely begun to consider equality of opportunity; in truth, many have not yet been convinced of the desirability of equality as opposed to identity. The general practice is to require all pupils to study the same subjects in the same way, and to make no distinction between mentally deficient and bright pupils; nor between those mechanically gifted and those who possess special abilities in other fields. All must be passed through the same "mill"; individual differences must be disregarded.

It is true that the problem of equality is being worked out with a fair degree of success in some schools, but these are relatively few in number and are confined very largely to cities. The schools in which least progress is being made are those of the small village and rural community. In this paper we are concerned, primarily with the village school. The following analysis involves an examination of the pupils, teachers, buildings, equipment, and the course of study.

The Pupils

In a certain village employing five teachers, the Binet test was given to the entire school, consisting of the twelve grades. Table I shows the distribution of the pupils according to intelligence (I. Q.) and school grades. It will be readily observed that somewhat more than one-half of the pupils are below normal intelligence; and that the proportion of feebleminded, borderline, and dull cases is abnormally large.

TABLE I. CLASSIFICATION OF PUPILS ACCORDING TO INTELLIGENCE (I. Q.) AND SCHOOL GRADE

Classification	I. Q.	Grade												Total
		I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	
Genius or "near" genius	above 140	...	...	...	...	...	...	...	...	...	...	...	...	...
Very superior	120–139	3	...	1	...	1	...	...	1	...	...	...	...	6
Superior	110–119	7	1	1	...	1	4	...	...	...	...	...	...	14
Normal	90–109	4	4	5	4	7	3	3	3	...	...	...	1	34
Dull	80–89	11	6	5	2	7	...	3	3	...	3	1	1	42
Borderline	70–79	1	2	3	...	1	1	2	2	2	2	2	...	18
Feebleminded moron	50–69	3	...	2	...	1	...	...	2	...	...	...	...	8
Imbecile	25–49	1	...	...	...	...	...	...	...	...	...	...	...	1
Totals	.....	30	13	17	6	18	8	8	11	2	5	3	2	123

This last fact is made especially evident in Table II which exhibits at each intelligence level a comparison between the number of children in this school and the number which we should find in a typical school of the same size.

It will be observed at once that the number of pupils below normal is unusually large. This condition is at least partially explained by the fact that in the village there has been a selection of families based upon industrial intelligence; that is, many of the workmen showing considerable ability have been directed to larger centers, places in which greater skill or foresight is required. Besides, the work in the industry supporting this village involves more drudgery than the same industry in neighboring villages and cities.

TABLE II. COMPARISON WITH TYPICAL SCHOOL

Intelligence Quotient of Pupils	Number of Pupils (entire school)	Number to be Expected If School Is Typical	Deviation from Normal
120–139	6	8	2
110–119	14	16	2
90–109	34	74	40
80–89	42	16	26
70–79	18	7	11
50–69	8	1	7
25–49	1	1(?)	.....

In Table III, the language spoken in the home of the pupil is shown, together with the number speaking each language at the different mental levels. An examination of the table brings out the fact that, of the English speaking pupils, 56.6 percent are below normal; of the Finnish, 53.6 percent; of the French, 61 percent.

TABLE III. LANGUAGES SPOKEN IN PUPILS' HOMES

Intelligence Quotient of Pupils	English	Finnish	French	Italian	Swedish	Total
120–139	5	1	.....	.....	.....	6
110–119	6	6	2	.....	.....	14
90–109	15	12	5	1	1	34
80–89	21	13	6	1	1	42
70–79	11	5	2	.....	.....	18
50–69	2	3	3	.....	.....	8
25–49	.....	1	.....	.....	.....	1
Total.....	60	41	18	2	2	123

A comparison of the pupils speaking English only with those speaking a foreign language in the home shows that a somewhat higher percent of the former are below normal intelligence, the ratio being 56.6 to 55.5. In giving the tests all pupils not speaking or understanding Engligh well were tested in their native tongue. I have found in testing a large number of children who speak a foreign language in the home that after they have asso-

ciated with English-speaking children for a year and a half or two years they test as high in English as in their native language.

Teachers

The teachers of the grammar- and high-school grades are normal-school graduates, and have taught five years or more. They are fairly well prepared for most of their work. The remaining three teachers are high-school graduates, have had *six weeks* of normal-school training, and have taught from one to five years. Of course, these teachers are almost wholly unprepared for their work, especially for teaching those pupils who speak only a foreign language. The lack of preparation is illustrated by the fact that in many cases these pupils receive no direct instruction in the English language, but are required to remain in school throughout the day in order that they may "pick up" the language by hearing others speak it.

Teaching Equipment

The equipment is meager. Two of the five rooms are provided with globes and maps for the teaching of geography. Each of the elementary grades has two sets of supplementary readers, which are old and in bad condition. The school has no library facilities.

Building

The building was originally a one-room school, but, as the population of the village increased, two additional rooms were built on the ground and two above the three. In so far as one can see there was no design or plan except to provide a place to keep the pupils during school hours. The heating, lighting, and ventilation are extremely bad. Two rooms are separated by a beaverboard partition only. In case of fire, there are but two narrow exits. The building, set in the middle of a sand lot, cannot be kept reasonably free from dirt and dust; the grounds have neither trees nor grass and are too small for play purposes. And, as is very commonly the case in village and rural schools, the toilets are a disgrace to a civilized community.

Discussion

A few observations concerning the adaptation of the course of study to the intelligence of the pupils are pertinent. As shown in Table I, the pupils of the school are distributed as follows in

regard to mentality; imbecile, 1; moron, 8; borderline, 8; dull, 42; normal, 34; above normal, 20. The imbecile cannot profit by the work of the school and should not be in this school at all. The morons cannot learn enough reading and arithmetic to be of particular value to them. Although they might be taught to do simple forms of mechanical work, no opportunity is offered in this field. The borderline cases may profitably be taught reading, writing, and the fundamental operations and very simple fractions in arithmetic. They might, if given the opportunity, acquire considerable skill in certain kinds of industrial work, but the school offers nothing in this field. The dull pupils may profit by much that is found in the ordinary course of study, but additional time and considerable work of an industrial character should be given them. Finally, no provision whatever is made for the pupils above normal; these receive the same training as those of lower mentality. It is thus clear that within this school there is identity of opportunity, but nothing that resembles equality, as far as providing for the different levels of mentality is concerned.

The fact that more than one-half of the pupils speak a foreign language in the home presents a difficult problem, particularly from the standpoint of teaching citizenship. In these homes scarcely any reading material is found except the foreign press, and this is often hostile to the institutions of our country. The pupils of this school are taught citizenship—if it may be dignified by this term—in the same way as children of the thoroughly American home; that is, they are taught a few dates in history, more or less disconnected facts about the government, the names of the presidents, and other points which are, for the most part, memorized with but little appreciation of their meaning. In order to exert a greater influence upon these pupils, the work of the school should be extended to the home; the parents as well as the pupils should be taught to read and to speak the English language. This would insure a type of reading matter more genuinely American for the home, and would develop a more favorable attitude towards America and things American. The school in some of the more progressive communities is taking the initiative in developing such an attitude, but in this village nothing is done in that direction, consequently the children (as well as the community and the state) suffer. That is, the child of the immi-

grant is not afforded an equal opportunity with the native child to become a good citizen.

When we examine the teachers, equipment, and building, we find scarcely a shadow of either equality or identity of opportunity, in comparison with the opportunity afforded by the better schools of today. In the latter the teachers are mature and well trained; and they employ much of the best material and most effective methods known to the educational world. The buildings are clean, well lighted, properly ventilated, and attractive; and the teaching equipment is modern and adequate. But in this village almost everything that goes to make up a modern school is lacking. Both building and equipment are wholly inadequate for obtaining the best results, and the majority of the teachers are immature and lack training. The pupils of this school are, therefore, clearly at a disadvantage with those of many other schools.

Although this village school is somewhat exceptional in regard to the mentality and nationality of its pupils, it is not unusual in other respects. It represents a common type found throughout the United States. The cause of such conditions is chargeable chiefly to one of our false notions of educational democracy, namely, the complete control of schools by local authorities. The remedy lies in the creation of a larger taxing unit; in adequate supervision by the county or state; in giving authority to the county superintendent (who must be free from political influence) to name or to nominate teachers; and in providing a central officer to condemn buildings and to prescribe modern types, without endangering his position through any sort of political chicanery.

THE USE OF MEASUREMENTS IN A SMALL CITY SCHOOL SYSTEM

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Up to the present time the measurement of the product of education, in most cases, has been left to the research student or to the school administrator. The results have been used either for writing theses on educational research, or for showing the superintendent or principal the condition of a school or class with reference to a set standard. The systematic use of standardized tests as a direct aid in teaching has been very limited. The classroom teacher has been unable to see the value of such measurements, not only because she knows little of the principle of measurements, but also because, as often happens, she does not even see the results of tests given to her pupils. Frequently, therefore, the teacher after scoring tests according to definite instructions, turns over the results to some one higher in authority without herself making any practical application of them.

Consequently many teachers have come to look on standard measurements as something which involves a great deal of extra work for themselves, and which seems to be of no practical value to anyone. Again, teachers who have had the meaning of scores explained to them, often raise the objection either that these scores do not give any additional information concerning the pupils or that they are so unreliable as to be of little value. Speakers at educational gatherings frequently emphasize the fact that it is useless to give tests unless something is done about them afterward; but they fail to say specifically what should be done.

In beginning the systematic use of measurements in any school system, the necessity for gaining the cooperation of the teachers is evident. With this in mind a department of measurements was established in the Richmond, Indiana public schools in the fall of 1919. The director of the work was also part-time principal of one of the grade buildings. The aim of the department was to make standard tests available for the classroom teacher, and to show her specifically how the results could aid in teaching. Since both educational and mental measurements were used (each as a supplement to the other), they will be discussed together.

Testing was not forced on any school or on any teacher, but announcement was made that tests and information concerning them would be supplied when called for. At first there was little response In the beginning therefore, the work was carried on chiefly at Baxter School over which the director had supervision. A group intelligence test was given to all the children in this school, and the Binet test was given to the very bright and to the very dull children. The Courtis Silent Reading Test and the Woody Arithmetic Scale, Series A, were also used in the proper grades.

The pupils who made high scores on both the intelligence and the educational tests were allowed to advance more rapidly than the normal rate of progress. Several did three half grades in one year. Those who were very dull were given, as nearly as possible, work suited to their ability. The ratings secured from these tests enabled the teachers to see each child as an individual problem and to aid him in overcoming his peculiar difficulties. "The greatest good to each pupil" thus becomes the slogan instead of "the greatest good to the group."

In the first three grades the pupils were grouped according to ability in the different subjects. Both the educational and the intelligence tests were used to make these groups as homogeneous as possible in ability. A pupil was sometimes in the highest group in reading and in the average group in arithmetic. The grouping was always kept flexible so that a child, whose improvement in any subject justified promotion, could be advanced to the next higher group. The brightest pupils were given more work than the average or slow pupils, and were often used as leaders for the slower pupils. A child of inferior ability was not expected to do average work. An effort was made to keep each child working up to the level of his capacity. In the upper grades the pupils of very low ability were sometimes excused from the less essential subjects like history and geography; and they were allowed to spend an extra amount of time on English, reading, writing, and arithmetic.

Long before this work in the Baxter School had been as thoroughly organized as has been described above, teachers and principals in other schools began to be heard from. They first asked that individual mental tests be given to those children who were especially poor in their work. When this request was complied with, some of these children were found to be subnormal; and

others were found to be normal but lacking in push and determination. When the teachers learned the difficulty, they were enabled better to deal with each child as an individual problem.

Soon requests from the various schools for group mental and educational tests became so numerous that it was decided to extend the tests over the whole city, provided there was no serious objection among the principals or teachers. The intelligence tests used were the Pressey Primer Scale and the Pressey Cross-out tests. The educational tests were the Courtis Silent Reading Test and the Woody Arithmetic Scale.

In order to "sell" this work to the teachers, a meeting was held in each school building. The value of the tests as an aid in understanding the child as an individual problem and in grouping pupils according to ability was discussed. The diagnostic value of educational tests was stressed as of especial importance. The use of the results in comparing one class with another and with a standard was also emphasized. The limitations of existing tests as absolutely accurate means of measuring a child's ability at any one time without regard to temporary conditions was explained. The teachers were told to use caution in forming any definite and far-reaching conclusion from the results of any one or two tests. The results from all the tests, both educational and mental, combined with their own judgments and the opinions of superiors must be taken into consideration.

These suggested applications of the tests were carried out to some extent in all buildings, but by some teachers much more than by others. The attitude toward the principle of testing is highly gratifying. All teachers in the city, so far as I know, are now advocates of intelligence and educational ratings as an aid in fitting methods of instruction to the needs of pupils. This result of the first year's work alone was well worth the time and money which has been spent in establishing the system in the schools of Richmond. It paved the way for an organized and widespread system of procedure in 1920–1921.

During 1919–1920 group intelligence tests were given to practically all children from the first grade through the junior high school, and the Binet test was given to about 160 pupils. Most of the pupils who were given individual examinations were selected from those who were very poor in their work and who scored very low on the group test. Twenty-seven were found to have I. Q.'s

of 69 or below. This means that the highest of this group will probably never develop beyond the mental level of eleven years—i. e., beyond ability to do fifth- or sixth-grade work—in the same time that the normal child would finish high school. Thirty made a score of 70-79 I. Q., which means that the highest of this group will probably never rise above the mental level of normal children of twelve or thirteen years. There were many other pupils in the system who would have made similar scores, but who were not examined because of lack of time. There are without doubt some errors in these scores, but it is certain that a large majority of these pupils will never be able to do the regular school work, and that they will always be a serious problem in the classes. A special school should be established for these children where they can be taught the essentials in reading, arithmetic, writing, language, music, and hygiene. But much of their time should be spent in some kind of manual training which will prepare them better to meet life in the outside world and to become self supporting.

The Courtis Silent Reading Test was used in grades IIIB to VIA, and the Woody Arithmetic Scale in grades IVB to VIIIB.[1] In a number of classes these tests were given two or three times in order to measure improvement and the effect of special methods of teaching. Other tests were used in smaller numbers with various classes.

The application of test results may be illustrated by giving some specific instances in which tests were of special value to teachers and pupils. In one second grade the intelligence tests showed that the pupils ranged from moron to very superior in ability. They were arranged into groups as homogeneous as possible taking into account the results of the tests, the scholarship records, and the judgment of the teacher. The members of the slowest group learned much more rapidly when taken from the regular classes. One boy with an I. Q. of 52 had been in school for a number of years without being able to read at all. In a group where other children were not greatly superior to him, he learned to read easy material. Until this arrangement was made the teaching went entirely over his head. On the other hand, the brightest group did much more than the normal amount of work for the second grade. Six of the brightest pupils were put into the next higher grade, and their present success indicates that they will continue to advance at more than the normal rate.

[1] At Richmond, Section B is low and Section A high in each yearly grade.

The Courtis Silent Reading Test was given to a very slow IIIB class four times. It was given in October, January, March, and May. The score for the four tests was as indicated in the following table:

	Test			
	1	2	3	4
Speed	90	75	105	150
Questions	12	16	14	25
Comprehension	35	50	80	85

These results include only the scores of the children who were there for all four tests. After each test the class was divided into three groups: the first, below standard both in speed and comprehension; the second, below in speed only; the third, below in comprehension only. With this arrangement the teacher was able to give to each child the special work he needed. The class in June scored above standard in all points. This increase in ability could not have been accomplished by teaching the class as a whole, or by grouping the pupils without regard to their individual needs. The children of this class knew the standard score for their grade and whether their own score was above or below it. The fact that they knew this helped them to work more intelligently to overcome their own difficulties. The teacher of this class, though skeptical as to the value of tests at the beginning of the year, is now an enthusiastic advocate of them.

There are a number of instances where the tests were of special value to certain children. An over-age girl in the IA grade made a very high score in reading. She was skipped to the IIA grade and continued to do good work in reading. If her record is maintained she will be skipped again and work off her retardation.

A third-grade boy was unable to make any score on the Gray Oral Reading Test. Since he was suspected of being feeble-minded, he was given the Binet test. This test showed him to be normal mentally; and accordingly further effort was made to find the cause of his poor reading. His eyes were tested with the letter chart and seemed normal. When questioned, however, he reported that the letters looked as if "someone had put a wet

blotter on the book" and blurred them. His eyes were treated and fitted with glasses; and at the close of the year he scored 39 on the Gray Oral Reading Test.

K. T., a boy six years seven months old, was in the IA. His mental age was found to be seven years ten months; and his I. Q. was therefore 119. His score on the Gray Oral Reading Test was 63, which is much above standard. He was promoted to the IIA and did above average work. He was promoted to IIIA at the close of the year.

F. A., a boy in grade IIA, was eleven years old. He was found to have a mental age of nine years three months. His I. Q. was 84. He was suspected of being feebleminded, but was really only slightly below normal. He was promoted to IVB grade and passed.

The chief value of the work in measurements for the year was that the teachers came to accept such measurements as of assistance in understanding children as individual problems, in grouping children according to ability, and in establishing more or less definite standards of attainment. Data were gathered to show the need of special classes for the subnormal. If these classes are established, the regular teachers will be relieved of their most difficult problems, and will thus be enabled to give more time to the normal pupils.

The work of the department in the future will be to organize the system so as to make possible a comparison of classes and schools; to apply the results in such a way as to affect methods of teaching, grouping of pupils, and modifications in the course of study; and to have direct and full supervision over whatever special schools are established, deciding which pupils are to be assigned to such classes, and what subjects are to be taught in them. The director should have authority to advise on special cases of double promotions and of failing pupils. The results of educational tests interpreted in the light of mental ratings would be very valuable in checking up the effectiveness of the various experiments in methods of teaching. Measurements should be extended into the junior and senior high schools where grouping according to ability is possible to a greater extent than in the grades. In order to carry work forward effectively every effort must be made to obtain the good will and cooperative spirit of teachers and principals.

A STUDY IN INTELLIGENCE AND EDUCATIONAL CORRELATIONS

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The study here presented was carried out with a unit group of seventh-grade pupils in one of the public schools of Fresno, California.[1] All the tests were given during a term of twenty weeks. Care was taken throughout to preserve uniform and normal conditions, and there was due observance of the instructions pertinent to the standard tests. The investigators had much previous experience in giving and scoring the various tests. Their purpose was to examine the reliability of the Binet-Simon Intelligence Test and the Otis Group Intelligence Scale as instruments in the adjustment and regrading of pupils.

Ninety-eight pupils participated in the experiment and, as far as possible, were given each of the following tests: Binet-Simon, Stanford revision, abbreviated scale; Otis Group Intelligence Scale; Courtis Standard Research Tests in Arithmetic; Ayres Spelling Scale, columns T and U, dictated; Trabue Language Scale C; visual vocabulary by the Thorndike Reading Scale B; comprehension in reading by the Courtis Silent Reading Test; writing for speed by the Ayres Scale, Gettsburg edition.

Before presenting the correlations between the intelligence and educational tests, it is interesting to note the extent of correlation between the Binet and Otis tests. This is indicated rather roughly in Table I. The figures in this table are based on the intelligence quotients derived from the respective tests.

TABLE I. COMPARISON OF RESULTS FOR THE BINET-SIMON AND OTIS SCALES

Tests	Highest Score	75-per-centile	Median	25-per-centile	Lowest Score	Average
Binet-Simon	133	100	89	83	56	92.4
Otis	154	103	88	67	40	87

These figures indicate a close correlation mathematically, especially in the upper range. The coefficient of correlation is 0.70

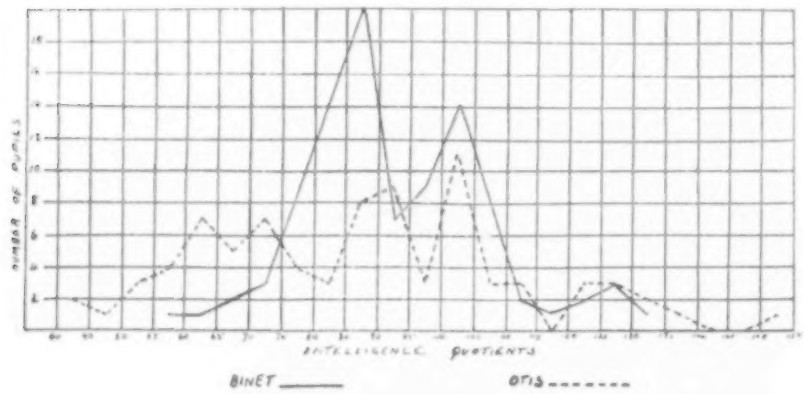
[1] Tests administered by Blanche Cummings, psychological expert in the public schools, Fresno, California.

by the Pearson formula (Probable Error, 0.04). This, though unquestionably high, is hardly large enough to prove a satisfactory general uniformity. This condition is emphasized by an examination of the rough data of the experiment, presented here only in part (see Table II). In these data a number of wide individual discrepancies occur, which may be due in some part to accidental vicissitudes in giving the tests. But whatever the cause, it is patent that the testimony of any single test should not be taken as final in estimating the intelligence of an individual.

The frequency distribution of intelligence quotients derived from each of the tests is shown on Figure 1. This discloses a wider range and greater irregularity of distribution in the case of the Otis test. It will be noticed that the distribution in the case of the Binet test is of fair normality.

Before taking up the educational correlations, a word should be said about the methods of scoring. In the case of the visual vocabulary test, the first, second, eleventh, and twelfth lines were omitted. The score was determined by the exact number of words defined, instead of by the method of inference suggested by Thorndike. In the spelling test, columns T and U of the Ayres scale were separately scored on the basis of 100 percent for perfect, and the results averaged.

FIGURE 1. COMPARATIVE FREQUENCY DISTRIBUTIONS FOR BINET AND OTIS TESTS



A difficulty was encountered in the scoring of results in the four fundamentals in arithmetic. The simple and commonly

practised plan would have been to score each individual on the number of "rights" in each operation. But it is recognized that there are two elements in each of the fundamental processes, rate and accuracy, or "attempts" and "rights." To score only the number right would have been to ignore the element of rate. What was wanted was a single coefficient to indicate true ability, which is relative to both rate and accuracy. To have derived such a coefficient by dividing "attempts" by "rights" would have been inaccurate, because $\frac{2}{2}=100\%$ as does $\frac{10}{10}$, although the performance in one case is five times greater than in the other case.

The solution was to draw up a chart of ascending values, a portion of which is illustrated below. The numerator of the fraction-like expression indicates the number of examples attempted, and the denominator the number right. The figure to the right of each expression is the score for the performance indicated by the expression. The complete chart was extensive enough to measure the best possible performance, i. e., $\frac{24}{24}$. The same form was used in scoring all four arithmetical processes. The following portion of the chart illustrates the principle according to which it was constructed:

$\frac{6}{6}$	42										
$\frac{6}{5}$	35	$\frac{5}{5}$	36								
$\frac{6}{4}$	28	$\frac{5}{4}$	29	$\frac{4}{4}$	30						
$\frac{6}{3}$	21	$\frac{5}{3}$	22	$\frac{4}{3}$	23	$\frac{3}{3}$	24				
$\frac{6}{2}$	14	$\frac{5}{2}$	15	$\frac{4}{2}$	16	$\frac{3}{2}$	17	$\frac{2}{2}$	18		
$\frac{6}{1}$	7	$\frac{5}{1}$	8	$\frac{4}{1}$	9	$\frac{3}{1}$	10	$\frac{2}{1}$	11	$\frac{1}{1}$	12
$\frac{6}{0}$	0	$\frac{5}{0}$	1	$\frac{4}{0}$	2	$\frac{3}{0}$	3	$\frac{2}{0}$	4	$\frac{1}{0}$	5

$\frac{0}{0}$ 6

An examination of the chart may disclose some apparent discrepancies. For example, are we justified in giving a small score to no attempts and no rights, and a zero score to six attempts and no rights? The principle of the scale demands this condition at its lower extreme; but it can well be justified by the assertion that it is better to know nothing and to know that you know nothing, than to know nothing and to think that you know something. But again, are we justified in giving a higher score to six attempts and three rights than to two attempts and two rights? And if we are so justified, then how about giving a larger score to two attempts and two rights than to six attempts and two rights? Can we say that power in addition, for example, ascends in this order: 6/2, 2/2, 6/3? It must be admitted that there is some interesting ground here for debate; but to the writer the assumption seems reasonable. We must point out that some of the following computations show as great correlation between intelligence and arithmetic as here scored, as between intelligence and some of the other educational subjects. Further, it must be noted that the chart is a regular ascending scale from the poorest performance to the best. The plan is presented for what it is worth, and criticism is invited.

Table II shows how the rough data were arranged for the purpose of studying the correlative positions of the various scores. In all, there are four such tables, but only one of them—the smallest—is reproduced here. The method of arrangement in these tables demands a careful explanation. The study is one of rank correlation, and the procedure was as follows. The mental ages derived from the Binet tests were placed in a vertical range from the highest to the lowest, equal ages being placed in parallel. The entire range was found to be from nine and a half years to fifteen years. This range was divided into four equal parts. It was then found that 9 pupils fell into quarter 1, which was the highest quarter; 35 fell into quarter 2; 29 into quarter 3; and 22 into quarter 4. The nine pupils who fell into quarter 1 were entered on Table II. The scores of these same pupils in the Otis and various educational tests were then ranged and divided into quarters in the same manner as just explained for the Binet test. The table finally showed not only the scores but the number of the quarter into which each score fell, for each of the nine pupils respectively, in each subject. This same method of tabulation

TABLE II. HOW THE ROUGH DATA WERE TABULATED FOR THE NINE PUPILS WHO FELL INTO THE UPPER QUARTER OF THE MENTAL-AGE RANGE BY THE BINET TEST.[a]

Pupil Number	Binet			Otis			Addition		Subtraction		Multiplication		Division		Spelling		Visual Vocabulary		Language		Reading Comprehension		Writing Speed	
	I. Q.	M. A.	Quarter	I. Q.	M. A.	Quarter	Score	Quarter	Score	Quarter	Score	Quarter	Score	Quarter	Score	Quarter	Score	Quarter	Score	Quarter	Score	Quarter	Score	Quarter
1	107	15	1	106	15	1	89	3	158	3	89	4	90	4	82	2	71	1	14	2	100	1	62	4
2	128	14-6	1	85			106	3	226	2	241	1	387	1	91	1	70	1	13	2	98	1	80	2
3	126	14-6	1	102	12-6	2	108	3	294	1	204	1	251	1	95	1	58	2	16	1	97	1	111	1
4	120	14-6	1	124	15	1	16	4	133	4	40	3	110	3	81	2	67	2	13	2	96	1	72	3
5	103	14-6	1				160	2	206	2	114	4	89	4	62	3	65	2			100	1	56	4
6	133	14	1	154	15	1	275	1	226	2	205	1	252	1	92	1	64	2	17	1	97	1	84	2
7	128	14	1	106	12-6	3	204	1	157	3	158	3	111	3	88	1	67	2	15	2	100	1	72	3
8	115	14	1	127	14-2	1	225	1	203	3	179	2	183	2	74	2	58	2	14	2	98	1	80	2
9	107	14	1				134	2	205	2	90	2	158	2	54	4			10	3	91	2		

The table shows the Intelligence Quotient (I.Q.), the Mental Age (M.A.), and the number of the quarter into which each pupil fell, according to each mental test. The score and number of the quarter for each of the other tests is shown.

[a]The *scores* are not comparable as between any of the subjects, except intelligence. The *numbers of the quarters* are comparable throughout, and form the basis for the study of the rank correlation, with the modification explained in the context.

was followed for the pupils falling into each of the other quarters by Binet mental age, thus producing four tables.

The preliminary theory was that pupils falling into quarter 1 by mental age should tend to fall into the corresponding quarter in the educational subjects; that those falling into quarter 2 by mental age should tend to fall into quarter 2 in the educational subjects; and so for the pupils in the other two quarters. But there is a fallacy in this simple scheme for studying correlations; for example, a child may score close to the bottom of quarter 1 in mental age and near the top of quarter 2 in addition, and his actual correlation in that case would be closer than that of a pupil who fell near the top of quarter 1 in mental age and near the bottom of quarter 1 in addition. This factor is inherent in the entire scheme, and practically negates the plan unless we provide a correction in our calculations.

In the matter of this correction, consider the group of pupils who fall into quarter 2 mental age. All of them who fall into quarter 2 in all the educational subjects show, for our purposes, a perfect correlation. But the pupils in the *lower* half of quarter 2 mental age may rightfully claim correlation with educational subjects to the extent that they fall into the *upper* half of quarter 3 in those subjects. And the pupils in the *upper* half of quarter 2 mental age may claim correlation with educational subjects to the extent that they fall into the *lower* half of quarter 1 in those subjects. To figure the total correlations for the pupils in quarter 2 mental age, we might count the number of times the educational scores rank in the identical group, and add half the times that educational scores rank in contiguous groups. This is admittedly a loose and a too liberal makeshift. To be true to the actual mathematical probabilities, we should have to take somewhat less than half the correlations with contiguous quarters although the difference would in fact affect our results but slightly. Our correction approximates the true condition.

The correction just explained applies to mental-age quarters 2 and 3. But since mental-age quarters 1 and 4 have each but one contiguous group, we may add, in each of these cases, *all* the times that educational scores rank in the contiguous group.

Thus for each mental-age quarter or group we allow a leeway for overlapping equivalent to one-quarter the range in each educational subject. The corrections as here explained will be made in the computations that follow.

Table III shows the frequencies of correlation with the nine educational subjects for the pupils in the respective mental-age quarters according to the Binet test. The second vertical column contains the nine pupils who, as already mentioned, fell into mental-age quarter 1. The table discloses that three of these correlated by rank with two educational subjects, one of them with three educational subjects, one with four, one with five, one with six, and two with seven. So for each of the mental-age quarters. Only pupils taking all the tests were counted. For the entire number it is found that the median number of educational sub-

TABLE III. FREQUENCIES OF CORRELATION OF EDUCATIONAL SUBJECTS WITH STANFORD-BINET INTELLIGENCE TEST FOR EACH MENTAL-AGE QUARTER

No. of Educational Subjects Correlating	No. of Pupils Correlating				
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Totals
1	0	0	0	2	2
2	3	1	0	6	10
3	1	3	3	4	11
4	1	3	9	2	15
5	1	10	5	2	18
6	1	8	4	2	15
7	2	3	0	0	5
8	0	0	0	0	0
9	0	0	0	0	0
Totals	9	28	21	18	76

Table reads (second line): Of the 9 pupils in the first mental-age quarter, three showed rank correlation with performance in two subjects; of the 28 pupils in the second mental-age quarter, three showed rank correlation with performance in three subjects; etc.

jects correlating with mental age by rank is 4.5 or, since there were nine subjects, a correlation of 50 percent.[2]

Table IV duplicates the method of Table III, except that the mental ages have here been determined by the Otis group test. The median number of educational subjects correlating by rank, for the entire number, is 4 or 44 percent.

TABLE IV. FREQUENCIES OF CORRELATION OF EDUCATIONAL SUBJECTS WITH OTIS GROUP INTELLIGENCE SCALE FOR EACH MENTAL-AGE QUARTER

No. of Educational Subjects Correlating	No. of Pupils Correlating				
	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Totals
1	0	0	1	2	3
2	1	0	1	2	4
3	3	1	0	3	7
4	6	2	8	4	20
5	2	9	3	2	16
6	4	3	4	2	13
7	2	1	0	0	3
8	0	1	0	0	1
9	0	0	0	0	0
Totals	18	17	17	15	67

It would seem, from this study, that there is only a fair relationship between attainment in either of the intelligence tests and attainment in the educational subjects taken as a whole, notwithstanding the contrary testimony of various investigations. Of the entire number of possibilities for correlation, only 50 percent of them were realized, even after allowing for the correlation

[2]This percentage statement of correlation is not to be confused with the coefficient of correlation. The above is simply a statement of the amount of rank correlation.

with contiguous groups as explained in a previous paragraph. From the present testimony there is not even the expectation that all pupils will come up to the 50 percent correlation, as equal numbers will fall considerably below and above that median. The writer admits the novelty of the method of study here used, and willingly submits the question of its validity to minds trained in the science of statistical research.

It might be suggested, as a check on results, that we take only those pupils whose mental-age quarters were identical for the two intelligence tests, and that we compare their intelligence rankings with their educational rankings. This would tend to obviate error in the intelligence tests. For such an analysis see Table V. Of 28 pupils who fell into identical mental-age quarters, this table shows how many of them found a rank correlation with one educational subject, how many with two, and so on. The median number correlating in this case is 4.25, or a correlation of 47 percent.

TABLE V. FREQUENCIES OF CORRELATION OF EDUCATIONAL SUBJECTS WITH BINET AND OTIS SCALES WHERE THE LATTER WERE IN AGREEMENT AS TO MENTAL-AGE RANK

No. of Educational Subjects Correlating	No. Pupils Correlating by Mental-Age Rank
1	1
2	2
3	3
4	6
5	8
6	7
7	1
8	0
9	0
Total.....	28

We may next take up the question of how each educational subject compared separately in rank with mental age. Table VI presents this comparison, the Binet mental-age rankings being used. We might here have expected a greater correlation for the more intellectual subjects than for those representing mere skill, but such distinction is not evident, except in the case of language which, it will be remembered, was measured by the Trabue Completion Scale. Various other investigations have shown a high correlation between this scale and certain standard mental tests, a fact that argues well for the validity of our own investigation. In the case of reading comprehension, we should have expected a high correlation if the Kansas or Monroe reading test had been used. The Courtis test is in fact standardized only through the sixth grade, and the indications were that it was too easy, in its intellectual elements, for the seventh. Our test did, in fact, show a fair range of performance, but the variation was probably due largely to sensory-motor factors.

TABLE VI. FREQUENCIES OF CORRELATION OF SEPARATE EDUCATIONAL SUBJECTS WITH MENTAL AGE BY THE BINET TEST

Subject	Addition	Subtraction	Multiplication	Division	Spelling	Visual Vocabulary	Language	Reading Comprehension	Writing Speed
No. pupils taking test.....	93	93	94	94	89	85	87	90	89
No. of correlations	45	45.5	40.5	45.5	49	43	56.5	46.5	46.5
Percent of correlation.....	48	48	42	48	55	50	64	51	51

The conclusion to be drawn from the entire study, if valid, is not encouraging. The tables show constantly a correlation that may be expressed as 50 percent, which means this: that the median pupil found a rank correlation with educational subjects to the extent of just half the opportunities. This is just the correla-

tion that would fall by chance. This last point is probable by the following reasoning: a pupil in mental-age quarter 2 would correlate with addition, for example, if he fell into quarter 2 in that subject, or in the lower half of quarter 1, or in the upper half of quarter 3. In other words, that pupil has a range of two whole quarters in addition in which to be marked plus in correlation, according to our scheme; leaving two quarters in which to be marked minus. That pupil has a "fifty-fifty" chance, which is almost exactly the amount of correlation that our investigation showed for the median pupil, counting all subjects.

We began this experiment with the purpose of testing the validity of the intelligence scale as an instrument in the regrading and regrouping of pupils. If our conclusions are to stand, the verdict must be colorless. Our results at any rate demonstrate that it is a dangerous thing to take the testimony of any single intelligence test as final proof of inferior or superior capacities in the conventional subjects. There is at present a tendency to push the intelligence tests into the hands of unscientific enthusiasts throughout the teaching force. Although these people may be trained in the accurate administering of the tests, it is in the uses they may make of results that the danger lies.

Editorials

CHILD ACCOUNTING

Is the once powerful tribe of child accountants passing off the scene? Assailed by hostile forces, is it like a nation of aborigines dwindling first to hundreds and then to scores and dozens and finally to the lone survivor, the erstwhile chief of a forgotten clan?

Twelve or fifteen years ago child accountants were first coming into prominence. Those were the days of the Thorndike-Ayres-Falkner-Winship controversy over elimination. The Psychological Clinic was born and thrived and dwindled. In its pages and elsewhere the controversy was carried on. Thorndike began it with his cryptic "The Elimination of Pupils from School." Falkner with far less insight but with rare statistical skill, Ayres with his lucid style and his promise of better things statistically, and Winship with his rhetoric, multiplied evidence and generated heat as to the correctness of the statement that only 40 percent of the pupils who enter school continue to the eighth grade. The up-shot of the controversy seemed to be that you couldn't tell how many children survive to each grade unless by individual record cards you could actually trace their history from the time they entered school. As far as we know, however, such a study has not yet been made despite its obvious value.

This was also the period during which Dr. Maxwell of New York first brought forward the question of age with respect to grade. How vividly do we recall the attention which Dr. Maxwell's figures attracted. They were pronounced at conventions, printed in newspapers, and transmitted by word of mouth. One superintendent would whisper to another, "Have you heard of the awful conditions in New York? Forty percent of the children are too old for their grades!" With Pharisaical satisfaction yet gravely, as befitted the sad occasion, the other would reply, "Yes, the school conditions in New York are very bad; but then you know that is what one must expect when politics run the schools." Whereupon the two would no doubt fall to discussing the Tweed Ring and Boss Crocker and Tammany as though

machine politics were somehow indigenous to the metropolis. After reading the report of Superintendent Maxwell or perhaps after hearing it discussed at an N. E. A. meeting, other superintendents, desiring to show how much better their school conditions were, began to collect the information as to the ages and grades of the pupils under their care. Whereupon, like as not, in one community after another a solemn hush ensued. The real truth appeared to be that for the most part conditions in other cities were no better than they were in New York. Perhaps they were even worse.

As a result of the ensuing agitation a very general effort was made to reduce the percent of over-ageness. Very likely not a little energy was misdirected; but on the other hand it is almost impossible to overestimate the good results that were accomplished. The number of elementary-school graduates practically doubled in the ten years intervening between 1908 and 1918, although during the same time the population of the country increased no more than 15 percent. No doubt one of the causes of the large increase in the number of graduates was the effort to reduce over-ageness throughout the country.

With the appearance of standardized tests and scales and the development of what has been called the measurement movement, the activities of the child accountants diminished. Some of those who had been engaged in counting noses now began to count "attempts" and "rights." Moreover, as new students of education became active, they tended to turn away from child accountancy and to busy themselves with median scores, and later with mental ages and intelligence quotients. In other words, the progressive school people and the research workers became interested in cultivating a new field to the neglect of the old one.

We make no secret of the fact that we think this is unfortunate. Questions of enrollment and attendance as measures of the extent of school service, of promotion as the official record of accomplishment, of retardation and elimination as indices of the adjustment of means to ends of size of class, length of school term, and teacher-to-pupil ratio as criteria of organization and as data for use in computing unit costs—these questions have independent as well as relative value.

For example, in a certain city a very liberal policy of promotion has prevailed for several years. The promotion rate—i.e.,

the proportion of children on register the last day of the semester who were promoted on that day—was about 95 percent. Not long ago a testing program was instituted in this city. It involved the use of two or three standardized subject-matter tests as well as a mental test. The results showed that, according to grade standards obtained elsewhere, the pupils in this city were not up to grade. In fact, in the subject-matter tests they were fully half a year behind the standards pertaining to the grades in which they were classified.

On the other hand, the children were relatively young for their grades, and a very large proportion of them were therefore completing the elementary school and entering high school. Moreover, when the achievements of the pupils in the subject-matter tests were compared not with grade standards but with the mental ages of the pupils—in other words, when achievement was compared with what the endowments of the children would lead one to expect them to achieve—it was found that their performance was unusually good.

A similar testing program was carried out in another city of about the same size and located in the same section of the country. In this city a conservative promotion policy was in effect. Results obtained on the subject-matter tests were well above the grade standards. Nevertheless, there was a very general tendency for children to be too old for their grades. Pupils who were in no way defective according to the mental test were two and three years older than the standard ages.

Now, it is not difficult to see what is going on in these two cities. In the city we have first mentioned, grade standards are sacrificed in order that children may obtain the benefits of the richer curricula of the upper grades. In the second city it is the pride of the superintendent that no pupil transferred from his school system to another is ever reduced in grade. Indeed, he reports that not infrequently his pupils are advanced at once to higher grades.

Which of these superintendents is right? Is either school system properly characterized merely by the results of a testing program? Do we not need the supplementary data which child accountancy provides? With them at hand, the superintendent in the first city can afford to continue his liberal promotion rate, take his losses in grade standards, and successfully maintain that his system is fulfilling the highest purpose of a school system,

namely, the training of the pupils. On the other hand, with the proper "accounting" of the children the superintendent in the second city will be revealed as paying an enormous price for the satisfaction of maintaining high standards in the grades. Or, more accurately, it is the children who are paying the price in wasted time and lost opportunity. No scheme of testing children can reveal the shortcomings of this system, for the tests cannot be given to the children who are not there, to the children, in other words, who should be in school and are not. Moreover, they cannot be given to the children who should be in the seventh or eighth grade when, as a matter of fact, they are in the fifth or perhaps in the fourth grade.

The condition is somewhat like that of a large elementary school in a certain city whose pupils on entering high school were found to be much stronger in English than the pupils coming from other elementary schools. After observing this long enough to be sure that it was really a permanent condition, the high-school principal sent the head of his English department on a three-day visit to the elementary school in question with instructions to find out how these results were accomplished. At the end of the first half day the head of the English department returned and reported that he had found out. He said that all but the very best were killed off before reaching the eighth grade. This elementary school had an enrollment of more than two thousand children, yet it had but one class of upper eighth-grade pupils. No doubt the precious grade standards in this school were a delight to the principal and teachers.

But one is impelled to ask whether schools are run for the purpose of maintaining grade standards. If they are, any one can have a good school. All one needs to do is to make promotion sufficiently difficult to secure. Under these circumstances a school becomes a ruthless organization in which unhappiness and failure are the lot of all but the few whose survival proclaims them the fittest. We are of the opinion that the schools are run for the benefit of the children rather than for the sake of standards. It is our notion that the promotion of a child is to be decided primarily on the basis of whether he will benefit more by advancement than by repeating the work of the lower grade. Nor is the question of his ability to benefit by the advancement to be decided entirely on the basis of the quality of work done in the lower grade. There

is a sense in which a higher law supervenes—the law in virtue of which a child should be promoted because of what he needs to learn rather than because of what he has learned.

In our judgment we need a revival of child accounting. We need it now more than we ever did. The undoubted advantages of the testing movement have been accompanied by some abuses. Superintendents and teachers are between the horns of a dilemma. On the one hand, grade standards ought to be high; on the other hand, in the bookkeeping of the school the accounts of pupils must show all possible progress. No estimate of the efficiency of a school system is complete if the case rests solely upon the results of tests. These results need supplementing in many ways, and one way is by a competent accounting of children.

B. R. B.

CALIFORNIA

The citizen of California may boast of climate and citrous fruit; and in so doing he is, no doubt, entitled to a hearing. To be sure he is a bit annoying, but this is rather because he exercises no restraint than because he hasn't a good case. But a far more legitimate source of state pride, though less often vaunted, is the public school system. Whether the Ayres index is right about it or not, the evidence is too consistent to be denied. To be sure, California still has some relics of unregenerate days which other states have disposed of. For example, she must still be listed as under the district system of local control. Moreover, she has at the top both a superintendent of public instruction and a state board of education. Even in these respects, however, the usual effects are largely mitigated. The districts, have been deprived of many of the powers that ordinarily make them a reactionary institution; while the state board and the state superintendent, because of fortunate personalities, get along together very much better than might easily be the case.

But with a few exceptions, which will doubtless be removed in the near future, the California system as a going-concern commands our all but unqualified respect.

There has just appeared a report of the special legislative committee on education, appointed by the California legislature of 1919. This report enters into the existing conditions in California and gives a glimpse of their historical development. It

then lays down what appear to the committee to be the lines along which the state should move in matters educational. The committee report is organized about four problems or questions, and to each of these a chapter is given. The first is the question of educational organization with particular reference to district and county units. The second is the problem of teacher training, both before and after teaching service begins. The third concerns the high school and junior college, and the fourth the cost of education.

The report mentions a number of hearings which the committee held, but it is impossible to distinguish the results of the hearings. Professor Cubberley wrote the report, and it is evident to all students of education that it strongly embodies his ideas. The committee is to be congratulated on its good sense in utilizing Professor Cubberley's ability. If one were censoriously inclined, one might ask why the committee held any hearings at all—in short, why it did not request Professor Cubberley to write the report at once.

To anyone who is interested in the development of schools, not only in California but elsewhere throughout the country, the passage of the sixteenth amendment to the California constitution is significant. This amendment was submitted to the voters last November and received their sanction. It adds kindergartens to the public school system and provides greatly enlarged state and county funds. The state is required to distribute to cities and districts an amount equal to thirty dollars per pupil in average daily attendance in the public elementary and secondary schools, *both day and evening*. The board of supervisors of each county is required to provide an equal amount for each pupil in average daily attendance in the public elementary schools and to provide twice as much money for each pupil in average daily attendance in the public secondary and technical schools. The legislature is also required to provide for the levying of local district taxes for public school purposes. Thus, from state and county sources combined a minimum of sixty dollars per elementary school pupil (day and evening) and a minimum of ninety dollars per secondary school pupil (day and evening) is provided. These amounts are in excess of the average per capita cost of elementary and high-school instruction even in progressive communities. Since a district tax is definitely required, the added amount for educa-

tional purposes is sufficient to place the schools of California in an enviable position.

One datum on this point may be of interest. The school people of Illinois are asking the legislature this year for an increase in the state distributable fund. This fund now amounts to six million dollars—a beggarly amount for the second state in the Union in wealth. Dr. Carter Alexander lately brought this out in an address in which he showed that if Illinois made the same effort that California was making *prior* to the adoption of the sixteenth amendment it would have a state distributable fund of twenty-three million dollars. But California has not been content with her former effort. She has, by referendum vote of the people, provided a state distributable fund—to say nothing of the even larger county fund—which is 75 percent higher than the former fund. To equal this Illinois would have to provide a fund of forty million dollars—or twice the amount which after much hesitation and many misgivings the Illinois school people have ventured to request. California got her increase from the people directly. We wonder if the people are not more interested in education and more willing to make sacrifices for it than most members of state legislatures are aware. We wonder in other words whether the schools may not stand a better chance of favorable treatment at the hands of the people than at the hands of their representatives. In any event recent events in California should be brought to the attention of state legislatures and the "deadly parallel" should be drawn. California not only provides handsomely for her schools but she serves magnificently the cause of education everywhere.

B. R. B.

Reviews and Abstracts

E. H. CAMERON, *Editor*

LEARNED, WILLIAM S., BAGLEY, WILLIAM C., and MCMURRY, CHARLES A., STRAYER, GEORGE D., DEARBORN, WALTER F., KANDEL, ISAAC L., JOSSELYN, HOMER W. *The professional preparation of teachers for American public schools: A study based upon an examination of tax-supported normal schools in the state of Missouri.* New York City: The Carnegie Foundation for the Advancement of Teaching, 1920. 475 pp.

When this investigation was first projected, it was planned that it should consist of two parts: one was to give the results of an examination of all institutions in the state engaged in preparing teachers for public schools; the other was to deal with the teaching population. This volume is the second in a series of three bulletins dealing with the first part of the inquiry. The first bulletin attempted to answer the question: What is the best preparation for teaching? It consisted of a set of curriculums for the preparation of teachers. The present volume deals with the educational and administrative aspects of the preparation of teachers in state normal schools. The third will consider the work of colleges and universities in teacher preparation.

The material found in this volume is an exceedingly valuable contribution to the literature bearing upon teacher preparation, for it represents the conclusions drawn from definite facts ascertained by competent educational authority. Information was secured by thorough personal inspection and investigation on the ground by the members of the survey staff. In a word, this investigation represents a successful attempt to secure the facts concerning the educational side of the work of Missouri normal schools and methods and plans of organization and administration of these institutions, and to draw valid conclusions concerning the success of teacher preparation in Missouri which could be justified in the light of the data secured. The surveyors also make recommendations for future procedure which seem to the members of the staff to be justified in the light of the conditions existing in the state.

The bulletin covers a wide range of topics, all of which are of vital interest to students of normal-school organization and administration. The more important are: the origin and growth of normal schools in the United States and in Missouri; government and control of Missouri normal schools, with suggestions for a better organization of professional preparation for teachers, including reorganization of state educational control; function and scope of organization of normal schools; personnel of the Missouri normal schools; curriculums; the operation of normal schools with reference to the president and staff and to the administrative treatment of student body; the product of the normal schools.

The reader of this volume is impressed with the earnestness and sincerity of the survey staff, the courage with which they criticize that which is bad, and the vision of teacher preparation which they present.

On the other hand, the reader is equally surprised at some of the attitudes taken, especially that toward supervision. These investigators frown upon present methods and attitudes of supervisors of schools. Apparently these officers would become

superfluous in the kind of schools which will appear when teachers are properly trained. In such schools

> the pupil would meet directly and constantly a well-selected and tested leader prepared to speak with personal effect and to win response by virtue of trained intelligence. Such leaders, instead of taking minute orders from higher officers, would themselves assume the responsibility, in joint action, for the conduct and development of instruction—the life-long business of capable minds. In other words, education would become a first-hand process by skilled practitioners, like any other professional service, instead of a second or third hand operation with its consequent perfunctory effects.

The writer of this review believes that this attitude toward supervision is unfortunate. It is doubtful if schools can ever be turned over to a body of teachers, however well trained, each of whom acts upon his own initiative, without effective and competent leadership and without efficient organization. The management of a school system cannot be compared with the private practice of law, medicine, or engineering. Nowhere has this form of conducting an enterprise like a public school system been found possible. The reviewer seriously questions whether this could be done in a system as complex as modern schools have become.

Another recommendation which seems to the survey staff capable of remedying many evils of the Missouri normal schools appear to the reviewer to be of very doubtful value. State normal schools as separate, individual institutions would be done away with and the normal-school system of the state would be organized under a single direction as a part of an enlarged and reconstituted state university. The survey staff cannot seem to entertain the idea that the Missouri normal schools can succeed without being closely connected in some way with the state university. It seems inconceivable to this group of men that the state of Missouri can maintain five state teachers colleges under a central state board of regents with a competent educator-executive at the head of each institution and allow the state university also to maintain its existence with a competent head under its own board of regents. On the contrary, finding that the university, five state normal schools and a number of high schools with teacher-training classes are participating in the work of preparing teachers, they conclude that

> There can be no reasonable question that better results than are now accomplished under these several managements could be secured under one control.

It is not clear to the reviewer that the state would act wisely by

> incorporating the present normal schools together with the university school of education as a state Division of Education fully organized and equipped to provide for all phases of the professional training of teachers for the public schools of the state. The normal schools would thus become State Colleges of Education within the university and subject to the same consideration as any other branches of that institution.

That the state normal schools of Missouri should be unified under one board and become high grade state colleges is entirely clear. But why should they be "within the university"? The reviewer fails to see why a state like any of the great states of the central west cannot maintain half a dozen efficient state teachers colleges with genuinely collegiate standards and requirements, each a distinct institution, but all under a properly organized board. The problems, however, involved in organizing and conducting a great university are so complex and so different from those connected with organizing and administering a great system of state teachers colleges that two

separate and distinct boards are necessary and desirable. With an ever-changing personnel it is difficult enough for a group of executives such as state normal-school presidents, to familiarize a board with the needs of one group of institutions. It is usually several years before a new member of a board of normal-school regents becomes thoroughly familiar with the workings of these schools and arrives at an understanding of their needs. If there is added to this the necessity of becoming familiar with the requirements of a great university with all of its varied fields and activities, the task becomes nearly impossible. For these reasons, it would be an unwise policy of state educational administration to place state teachers colleges and the state university under one board.

Furthermore, it is not clear that a university college of education can or should participate to any great extent in the preparation of teachers for a state. This is the work of state normal schools. The college of education in the university has a different function.

Without doubt, each state should have an able and competent superintendent of public instruction who might be *ex officio* president of both the normal-school board and the university board. He should, at any rate, be the most influential member, the educational advisor, and the coordinator of these boards.

The reviewer seriously questions the wisdom of consolidating all the teacher-preparation agencies of the state under one direction, subject to a chancellor of the university who would be coordinate with the commissioner of elementary and secondary education. On the other hand, there is a good deal of experience which warrants the view that separate university and normal-school boards made up of intelligent public spirited citizens interested in education with the state superintendent of public instruction as the educational expert of each board, constitute a better form of state educational organization. Under this form the president of the state university and the president of each state teachers college would have equal rank and all would recognize the state superintendent as their superior officer. The reviewer emphatically dissents from the view that the great system of state teachers colleges such as that which Missouri should have can succeed only if made a part of the state university and controlled by the chancellor and by a board which is primarily a board of curators of the university proper, to which the decisions of the board of executives, consisting of the heads of the teachers colleges and the university dean of education, must be submitted for approval.

The authors of this bulletin make a strong plea for the teaching in normal schools of courses in the so-called academic subjects for both elementary and high-school teachers—courses which shall be of distinctly collegiate grade in quality and quantity. They hold that in such subjects as arithmetic, children's literature, algebra, and geometry it is possible to have a kind of course which will not be simply a review of previous elementary or secondary school work, nor the old time so-called professional review, nor purely academic work in the sense that this term is used in connection with courses in liberal arts colleges, but a new kind of course consisting of advanced work strictly of college grade with a professionalized type of subject-matter. The purpose of such courses would be to lay a broad foundation of scholarship and appreciation for prospective teachers, giving a new, a larger, and a different kind of insight, and a broader conception of subject-matter than the students previously had obtained.

In the judgment of the writer, this idea of a new type of subject-matter courses is one of the highly commendable features of this report. For example, in connection

with the process of long division in arithmetic, the survey staff believes that the prospective teacher

> should understand the mathematical logic of the process; he should know how it evolved, and particularly the disadvantages of the more cumbrous processes that preceded it. He thus acquires a quite new view of something with which he already has, in his own judgment, a considerable measure of familiarity. His added knowledge may not include materials which, as a teacher of elementary arithmetic, he will pass on to his pupils, but it will deepen his appreciation of the importance of what he does pass on, and it will clarify his own understanding of the process itself.

In the lower grades,

> even the primary teacher, struggling with the development of the simplest number concepts and processes, will find new insight and inspiration for her work in a knowledge of primitive number systems and of the steps that the race traversed in its development of the existing system of notation and numeration. If to these genetic studies one adds relevant excursions into the psychology of number, especially in connection with tests and scales, it is clear that a course of distinctly advanced character and quality is obtained.

The principle of specific preparation for specific types of teaching service receives due recognition in this report. Differentiated curriculums for primary, intermediate, grammar-grade, rural, and high-school teachers are recommended, as well as separate curriculums for teachers and supervisors of special subjects. This recommendation will receive support by normal-school teachers and administrators and by public school people in general, for it represents one of the leading tendencies of the day in normal-school organization.

There has been a tendency to discredit courses in psychology in normal schools especially in the first year. This has been due, not to the fact that psychology has no place in the preparation of teachers, but rather to the fact that the materials included in the courses in psychology have been very poorly chosen. The old-time course in general psychology dealt very largely with such topics as consciousness, association, perception, conception, judgment, reasoning, and volition. The material found in the traditional formal textbook on psychology was abstract, philosophical, metaphysical, and speculative to such a degree that its value for young teachers was very doubtful. This kind of psychology may well be thrown out of the normal-school curriculum, but in the judgment of the reviewer there is a type of material dealing with the mental processes of children in connection with the learning of elementary and high-school subjects which has great value. It is gratifying to find that the survey staff supports the view that the proper type of educational psychology—as well as other similar basic sciences—has a definite place. They

> conclude, then, that the study of psychology in the teacher's curriculum has to fulfil two fairly distinct functions: (1) it must provide a basis for explaining and interpreting successful teaching practices as well as principles from which to derive new and better practices; and (2) it must furnish a working theory of the mental life as a basis for understanding the larger problems of education, many of which are only remotely connected with teaching. For the latter purpose psychology is only one of the several subjects of study, each of which should contribute its quota of principles, hypotheses, and points of view to a general theory of education. A substantial groundwork in biology is doubtless as important in this regard as psychology, while the claims of economics, sociology, and the history of education should not be overlooked.

The suggestions which the investigators make with reference to the organization of courses in psychology and other strictly educational subjects are thoroughly good

and constitute perhaps the best brief statement on these subjects now available. It may well be studied carefully by teachers of education in normal schools and colleges.

In the mind of the reviewer the discussion of practice teaching in this bulletin is one of the best features of the report. They find that in Missouri the training departments tend to be relatively weak as compared with other major departments in the normal schools. The survey staff deplores the fact that there are so few children available for training purposes and that there is no effective connection with local elementary and high schools. This is, however, one of the outstanding difficulties in nearly all normal schools throughout the country. The discussion of standards of practice facilities and the suggestions for organizing and administering practice teaching are thoroughly excellent. Many bad conditions were found in connection with training departments in Missouri, such as inadequacy of courses in observation and practice, the subordinate position of the training school, inferior housing, unsuitable hygienic conditions, unsatisfactory correlation of work of normal department and training department. In order to provide a solution for these difficulties the survey staff offers several excellent recommendations which normal-school administrators recognize as fundamental:

> The training school must be under the direct control and supervision of an expert administrator fitted by experience and by specialized training for this type of work, and this director or superintendent must have under his immediate charge a corps of carefully selected and specifically trained critics or supervisors. The supervisory staff should include many, if not most, of the members of the so-called academic departments, and the entire group should form what might be termed a training-school 'cabinet.' This body should legislate upon all matters concerning the organization of the training school curriculum and questions of educational policy; the superintendent or director, as the officer in whom administrative responsibility is lodged, should have authority to make decisions upon all matters of administration, with the provision that any other member of the cabinet may appeal from his decisions to a higher administrative authority.
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> A plan of this sort would ensure (1) the administrative autonomy of the practice school under a single responsible head, and (2) the responsible cooperation of all academic departments and all members of the critic staff in the organization of the school, the construction of the curriculum, and the oversight of the student-teachers.
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> It is advisable, we believe, to combine the headship of the department of education and the directorship of the training department in one and the same person. The other members of the staff in education should also have definite responsibilities in the administration and supervision of the training school to the end that every class in educational theory may be in charge of a teacher who is in daily touch with the actual problems of teaching and management in an elementary or a secondary school.

The tendency on the part of normal schools to develop into local universities is deplored. The specific function of normal schools as agencies for training teachers is clearly and excellently set forth; and the tendency, now beginning to appear throughout the country on the part of normal schools to dissipate their energies and spend their funds in maintaining liberal arts colleges, is severely criticized. The survey staff sets forth its criticism here in vigorous language, maintaining that

> it is difficult to justify the proposal of any school . . . to use its share of the all too scanty training funds to develop a local university. This means . . . to relegate its training of teachers to an inconspicuous department; to promote the other phases of collegiate work for their own sake and not alone as they produce better teachers; to fill classes, as college classes are now filled, with some

> who will teach, some who will farm, some who will be politicians, and many who have no specific purpose; in other words, to sacrifice the enormous advantage of momentum and morale that inheres in a single fine idea well worked out, for a round of inevitable mediocrity. For the school has at best wholly insufficient funds for its present logical purpose—the preparation of a competent teacher for every position in its district. To take over other subjects, as these are conceived in modern education, is not only to fail in its proper task, but to fail altogether.

They claim further that

> a good normal school is a professional school throughout and can not be an arts college; if it wishes to conduct a college that is self-respecting, it must have double funds, separate classes, another faculty selected for that purpose, and so on. The combination is not a happy one in any place where it is now on trial, and the logic both of theory and experience is against it.

Everywhere throughout this volume higher standards of teaching and better work both in quantity and quality are strongly urged. Especially insistent is the recommendation that normal schools, or teachers colleges as they are now coming somewhat generally to be called, must be on the same plane of scholarship as the best universities and colleges. The fact is acknowledged that very many normal schools are already in this class, and it is gratifying to find this admission set forth in emphatic terms in connection with the equally emphatic demand that standards of normal-school instruction everywhere be raised to the highest collegiate level. The following statement will be accepted as thoroughly justifiable:

> Longer to maintain the distinction between the university and the normal school as representing a distinguishable difference in grade or quality of instruction is, in the cases of the best normal schools in this country, purely factitious; and its eradication would be the best possible reason for requiring of inferior schools a genuine enforcement of the standards to which most of them now profess their adherence. In the numerous American normal schools now doing thoroughly standard work, the instructors have as broad and as intensive training as those giving instruction to students of equal advancement in good colleges and universities, and are quite frequently superior in this respect. In the content of instruction the normal school provides a specialized professional organization of material that in its field is as significant technically as any work in medicine or law. The teaching in first class normal schools is probably in advance of that to be found in ordinary arts colleges or even in the better medical and law schools.

Finally, it may be said in general that this document is a most inspiring piece of educational literature to anyone who is vitally interested in a better preparation for teachers. No other discussion of this topic contains so many suggestions for improving methods of teacher preparation or so fearlessly criticizes that which the authors believe to be wrong in conception, or faulty in execution. The criticisms are as inspiring as the vision of better preparation of teachers. The authors, as well as the Carnegie Foundation for the Advancement of Teaching, have rendered a great service in producing this volume.

H. A. Brown

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Oshkosh, Wisconsin.

Coursault, Jesse H. *The principles of education.* New York: Silver Burdett and Company, 1920. 468 pp.

The author aims "to present with logical cogency a simple and definite system of principles for guiding educational thought and practice." He has taken his task

seriously. He has read widely and with painstaking care a large amount of literature, has been associated with some of the leading educational theorists in America, and has had twelve years of classroom experience as teacher of the subject, supplemented by other work in the training of teachers. The culled fruit of this reading, association, and experience is gathered together in this volume.

The general point of view of the book places its author with those who (a) regard true education as a process of growth, and (b) propose to put education on a scientific basis. And while both ideas are rather narrowly conceived, so that many who would agree with the author as to the desirability of the proposed ends would find themselves in fundamental disagreement with him at important points, no one could study the book without arriving at deeper insight into the relation of educational theory to social life. The book represents a big view and sustained cogitation.

Professor Coursault's "Principles" is a most difficult book to estimate fairly, for this reason: it presents a living theory of education in the most deadly manner imaginable. A sermon by Jonathan Edwards is wildly exciting in comparison. The doctrine for which the author stands is expressive of the pioneer spirit in the contemporary educational world, but the whole cast of the book is medieval. The present reviewer agrees with the four teachers to whom he handed the book for a criticism of the chapters on their several fields of instruction. Without exception they spoke of having found interesting and enlightening suggestions in the chapters dealing with their subjects, and without exception they expressed their utmost sympathy for any students whose instructor should be misguided and inhuman enough to choose Professor Coursault's "Principles" as their textbook. This criticism does not mean to imply that college texts should be popular reading but simply that they should be a good deal more than lecture notes run through a printing press.

M. C. Otto

University of Wisconsin

Hubert, William Nutt. *The supervision of instruction.* Boston: Houghton Mifflin Company, 1920. 270 pp.

The purpose of this book is not only to state and analyze the principles of supervision but also to give concrete devices and a technic for the administration of the principles.

The book is well organized and written in a very readable style. In the introduction the author states that there are two fundamental and distinct questions in the problem of training supervisors. (1) "What are the activities that supervisors in training schools and in public schools carry on in the performance of their duties?" (2) "What are the kinds of training that best prepare supervisors to perform these duties?"

In the first part of the book the author defines the work of the supervisor and analyzes it into eight distinct phases as follows:

1. He must lay the basis for effective cooperative teaching.
2. Select and organize the subject matter of courses of study.
3. Teach for purposes of demonstration and experimentation.
4. Direct systematic observation.
5. Direct the teaching activities of his teachers.
6. Check up progress made by pupils.
7. Measure the efficiency and progress of his teachers.
8. Measure the efficiency of his own supervising performances.

The second part of the book is devoted to a description of methods, devices, and technic for accomplishing the eight duties of the supervisor. Unlike most writers on supervision the author does not stop with general statements but gives details of method and numerous illustrations of devices and technic.

At the end of each chapter there is a brief summary and also a list of class exercises. Because of the wealth of concrete illustrations and suggestions the book is well adopted for classes in training schools. Superintendents and supervisory officers will also find it helpful and suggestive.

P. R. STEVENSON

University of Illinois

HUDELSON, EARL. *Hudelson English composition scale.* Yonkers-on-Hudson: World Book Company, 1921. 46 pp.

The Hudelson English Composition Scale differs from other available composition scales. It is printed in monograph form instead of on a single sheet. An entire page is given to each step of the scale. In addition to the scale itself the monograph contains the following sections: (1) purposes and use; (2) how to use the Hudelson Scale; (3) samples for practice in scoring.

The scale consists of sixteen compositions spaced at intervals of approximately 0.5 P. E. The values of the compositions were determined by the average rating given to them on the Nassau County Supplement to the Hillegas Scale by 96 teachers of composition who had been given two weeks intensive training in the scoring of compositions by this scale. Eleven of the 16 compositions were written by school children in the state educational survey of Virginia. Four compositions were taken from Thorndike's collection of 150 compositions arranged for use in psychological and educational experiments. One composition was chosen from the Thorndike Extension of the Hillegas Scale. The compositions written by the Virginia school children were on the topic "The most exciting ride I ever had." The scale is recommended for use with this topic. The grade standards for the scale were derived from those obtained from the Nassau County Supplement to the Hillegas Scale. The themes used as the basis of these standards were written on the topic "What I should like to do next Saturday." Mr. Hudelson states that he has found that when the same children write compositions on the two topics "The most exciting ride I ever had," and "What I should like to do next Saturday," the median scores of the themes, on the first topic are 0.78 of a step higher than when both are rated on the Nassau County Supplement. Thus in making the comparison with the norms it is necessary to subtract 0.78 from the scores. Thirty compositions whose values have been determined on the scale are given for practice and by means of this list a person may train himself to rate themes with a high degree of reliability.

From a practical point of view the fact that the scale is not printed on a single sheet of paper so that one may have all of it before him at one time seems to constitute a distinct handicap. It is possible that this handicap may be no more than one of inconvenience but it seems not at all unlikely that it might materially influence the ratings given to the compositions. The steps of the scale are about half that of the Nassau County Supplement and the Willing Composition Scale. This makes a more finely divided instrument. Unless the use of the scale shows that it is impossible for one person to rate compositions more accurately than one P. E. this feature of the scale should increase its usefulness.

W. S. M.

News Items and Communications

This department will contain news items regarding research workers and their activities. It will also serve as a clearing house for more formal communications on similar topics, preferably of not more than five hundred words. These communications will be printed over the signatures of the authors. Address all correspondence concerning this department to Walter S. Monroe, University of Illinois, Urbana, Illinois.

Journal of the N.E.A.

The first number of the newly organized *Journal of the National Education Association* appeared under date of January, 1921. This journal, which is edited by W. C. Bagley, supersedes the *Bulletin*. An Editorial Council is provided for which is to be primarily a legislative body charged with the responsibilities of determining editorial policies of the publication. The first number is largely devoted to editorial announcements and propaganda relative to education legislation. The journal is distributed to all active members of the N. E. A. The announcement is made that the membership this year will exceed 100,000. A journal which reaches a large number of educators has an unusual opportunity as well as responsibility. It is to be hoped that appropriate recognition will be given to the field of research.

A Latin Laboratory

At the University of Wisconsin in connection with the training of teachers of Latin, a so-called Latin laboratory is in operation. Its purpose is to collect and organize as much material as possible which will be of use to teachers of secondary Latin. Lists, for example, of Latin plays and stories are available. A periodical leaflet, *Latin Notes*, is issued. Material for supplementary teaching in Latin is devised, collected, and distributed—material which gives meaning, not to say punch, to the teaching of Latin. The laboratory is under the direction of Professor Frances E. Sabin. The organization of this sort of a bureau or laboratory with reference to other subjects of the curriculum would add materially to the service work of state universities and state departments.

American Educators in Foreign Countries

Dr. Lester M. Wilson, Professor of Psychology in the Eastern Illinois State Normal School, Charleston, sailed January twenty-sixth for Lima, Peru, where he has the position of Director of Studies and Examinations for the Republic of Peru, at an annual salary of $7,200. Dr. Wilson will have charge of the certification of teachers, the making of curriculums for elementary and secondary schools, and the standardizing of schools in the new five-year program that Peru is now putting into operation for the improvement of its school system. Dr. Wilson is one of thirty educators whose services have been secured by the Peruvian government. Dr. H. G. Lull, State Normal School, Emporia, Kansas, is to become head of the teacher training work.

Professor E. E. Jones, head of the Department of Education, Northwestern University, will sail late in May for Albania to assist in the reconstruction of their educational system. In addition to Professor Jones the Albanian government expects to secure the services of at least one other American educator who will assist them in their educational activities.

This step on the part of the governments of Peru and Albania confers an unusual compliment upon American education. It is not many years since America was drawing heavily upon certain European sources for its educational inspiration. It is very gratifying to find that we have now progressed to the point where other nations are looking to us for guidance in educational matters.

Ohio Educational Research Association

Information coming from Ohio during the past few months has indicated a keen interest in educational research on the part of school men of the state. A great deal of this has centered about the activities of Professor R. L. Morton, Ohio University, Athens, Ohio. Professor Morton tells in a recent letter of the organization of the Ohio Educational Research Association. He points out the attempt to safeguard the organization so as to "insure a membership of active constructive workers." The methods employed are indicated in the following paragraphs which are quoted from his letter:

> Applications for membership must first be approved by the executive committee and then accepted by a majority vote of those present at a regular meeting. The executive committee plans a thorough inquiry into the training and experience of each applicant particularly the applicant's training and experience in studying educational problems scientifically. Furthermore, at no time shall the total membership of the organization be permitted to exceed 100 persons. A scramble for the 37 empty berths has already begun and it is anticipated that there will soon be a waiting list.
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> One section of the article on membership reads as follows: 'Annually, on January first, the secretary-treasurer shall revise the membership list eliminating therefrom (a) those who have failed to maintain membership in the Ohio State Teachers Association; (b) those who have failed to pay their dues in this Department for the year just ended; and (c) those who have failed, in the judgment of the executive committee, to submit to the secretary-treasurer in the two-year period just ended, evidence of constructive activity in the field of educational research."

In view of the fact that a number of similar organizations in other sections of the country have failed to maintain constructive activity, this attempt of the Ohio Educational Research Association will be watched with interest by many persons. If the association survives the decline of interest and enthusiasm which will inevitably come after the newness of the project wears off, it will have demonstrated the value of the plan of organizations.

The officers of the Association follow:

President: R. L. Morton, Director and Professor of Education, Extension Department, Ohio University, Athens.

Vice-President: A. R. Mead, Professor of Education, Ohio Wesleyan University, Delaware.

Secretary-Treasurer: F. J. Prout, Superintendent of Schools, Chillicothe, Ohio.

The Executive Committee consists of the president, the secretary-treasurer, and three other members, as follows:

Garry C. Myers, Head of Department of Psychology, Cleveland School of Education, Cleveland.

John R. Patterson, Superintendent of Schools, Bucyrus.

Can Students Estimate Their Own Intelligence?

In our classes in mental tests the question is frequently asked by the students whether it is very wholesome for children and students to be told the results of the

tests, or in any way to be made aware of their relative standing in intelligence. To this question the reply is invariably made that students and children usually know their relative standing in mentality anyway. Recently a situation has been created in our school which may throw some light on the extent to which this reply has any basis in fact.

At the opening of our first quarter this year, our school decided to permit such students as succeeded in making a score in the Army Alpha Test which was equivalent to that of the upper fourth of our college distribution to carry one hour in addition to the sixteen hours which are normally allowed, and to permit those who made a score equivalent to the upper eighth of the distribution to carry two hours extra. Under such conditions it is reasonable to suppose that those students who feel that they are unable to pass the test will not make the attempt. However, the situation is not free from disturbing factors. Most of the students did not know just what their relative standing among their classmates had to be in order to pass the test. Others were impelled to make an attempt in order that they might, if successful, be permitted to take the program which they had planned. It is not always an easy matter for students to make out a program of just sixteen hours which contains the courses they most desire to take. Still other students who were bright did not desire to carry extra hours and therefore did not come up for the test. In spite of these disturbing factors, I think our results are of some value.

Several years ago 265 of our students took the Army Alpha Test. Of these students 85 percent were in their first and second college years and the remainder in their third, fourth, and fifth years. From the results of these tests we obtained the upper quartile and the upper octile which are now used as standards for determining whether a student shall be permitted to carry only the normal 16 hours or one or two hours additional. The upper quartile is 141 and the upper octile 154. For the same results the median and the lower quartile are 122 and 104 respectively.

At the opening of the fall and winter quarters of the present year, a total of 46 students took the extra hour examination. For this group the first, second, and third quartiles are 130.6, 147.5, and 162.5 respectively. The median for this group, therefore, is three points higher than our standard quartile and the upper quartile for the group is eight points higher than our standard octile. To express the result in other terms, 41 percent of the extra hour group equaled or exceeded the upper octile and 61 percent equaled or exceeded the upper quartile of our standard distribution. The remaining 39 percent fell below the upper quartile but only 17 percent fell below the median of the standard distribution. If it be assumed that students who exceed the median of their group know that they are bright; and if the element of chance and the size of our group be left out of account, it may be said that 83 percent of our students knew that they were bright, or ranked above the average intelligence of our student body. This is true in spite of the fact that many of the students took the examination under the pressure of their desire to carry a program which appealed to them. If the factor of chance be allowed, 62 percent knew that they were bright.

It should be pointed out in this connection that of the extra hour group 25 percent were in the third, fourth, and fifth years. This is 10 percent more than were in the group upon which our standards are based. The students of our upper classes test distinctly higher than those of our lower classes. The median score of a group of 57 third, fourth and fifth year students is approximately 144. The higher percent of

upper class students is somewhat offset by the fact that 5 percent of the group belonged to our high-school group.

J. D. HEILMAN

Colorado State Teachers College, Greeley, Colorado

Scale for Measuring Ability in Silent Reading, Picture Supplement Scale 1, or PS-1

The new scale for the measurement of ability in silent reading, Picture Supplement Scale 1, consists of a single sheet of paper, 12 inches wide and 19 inches long. The sheet is divided into five columns. Each column is divided into four sections, and in each of these sections there are a picture and a paragraph about the picture. The paragraph tells the child to make a mark or line with his pencil to supplement the meaning of the picture.

The instructions are extended through the paragraphs in such a way that they cannot be fully grasped unless the entire paragraph is read. They are so worded that they cannot be misunderstood in moderately careful reading; and can be correctly followed in only one way. There are no tricks or puzzles. The child who guesses is almost sure to make a mistake; but if he reads carefully his answering markings will be "right"; that is, they will be in accord with the instructions given him. The paragraphs are all of equal difficulty; and the child's score is the number of paragraphs which he can read and mark correctly in five minutes.

The new scale is designed to measure silent reading ability in grades three to eight inclusive by strictly utilitarian standards. The attempt has been to devise a test in which the child can readily succeed if he reads well enough to grasp the important thought in each section, and in which he cannot succeed at all unless he does comprehend each important thought. The scale measures the ability to read carefully; it measures, that is, the ability which is commonly necessary for the effective use of text and reference books.

Picture Supplement Scale 1 has four outstanding characteristics. The first is that it makes a definite attempt to measure a single ability, which is the ability to read silently a single type of material, at a constant level of difficulty, in a fixed period of time. It measures the amount of reading of a practically useful nature which the child can do in five minutes.

The second outstanding feature of the new scale is that, in its construction, extraneous, non-reading factors have been eliminated. A careful attempt has been made to discover the controlling factors which govern the child's performance in silent reading. Some 25 such elements have been identified. One, the child's rate of reading, has been adopted as the variable to be measured; and the remaining 24 factors have been, in so far as possible, held constant. It is believed that by following this method a test has been prepared in which every task presents the same type of reading difficulty as every other, and for which the scores represent comparative amounts of one single sort of reading ability.

The third outstanding feature is that the test is planned for classroom use. It can be given to large numbers of pupils simultaneously. It requires five minutes for actual testing; and can be scored accurately, rapidly, and easily, without the use of a key. The cost of printing has been kept extremely low.

The fourth outstanding feature is that, on the basis of results secured through extensive classroom experiments, grade scores have been turned into equivalent scale

values. This makes it possible, in testing with Picture Supplement Scale 1, to measure the ability of each child in terms of its relation to the known abilities of other children, who are approximately of the same degree of maturity, and have received approximately the same amounts of training.

Picture Supplement Scale 1 has been developed through a long series of experiments, in the course of which five other scales for measuring silent reading were devised, tried out, and laid aside. The monograph on "The Measurement of Silent Reading" which is now in press, describes these experiments in detail, and devotes several chapters to the discussion of the fundamental principles of measurement which were identified as basal to the work in silent reading. Special attention is given to the reasons which led to the adoption of the "scale for amount done," with quality and difficulty held constant, as differentiated from "scales for quality of product," or "scales for difficulty reached."

Since for practical work in the classroom it is clearly desirable to make available several alternate editions of a scale, so that children tested on one may later be again tested with new material of equal difficulty, and their progress noted; companion editions to Picture Supplement Scale 1 have been prepared, and will shortly be available. Picture Supplement Scales 2, 3, and 4 are of the same type and the same difficulty as Picture Supplement Scale 1. The four scales may be used interchangeably; and scores secured in one may be compared directly with scores secured in the other three.

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Meeting of the American Psychological Association

The recent meetings of the American Psychological Association, held at Chicago during the Christmas holidays, included a total of 57 papers, three addresses, and a symposium. Under the circumstances, the writer acquiesced to the request that he report the meetings, for the JOURNAL OF EDUCATIONAL RESEARCH, only after some hesitation. However, many of the papers dealt with subjects hardly of interest to readers of the Journal. In other instances there was a certain amount of duplication. So—the reader need not dread a catalog of the entire 57.

A preliminary classification of the entire series is, however, of some interest, in fact, of some importance as indicative of present trends in research. Thirteen papers, according to the writer's count, dealt with some phase of learning—the largest single group of papers. Twelve dealt with measures of ability or related matters. Five dealt with measures of emotional or other non-intellectual traits. Seven papers were of a theoretical nature, eight of the older type of experimental work; eight dealt with abnormal psychology, nine with animal psychology, eight had to do with psychology in business. Twenty related more or less explicitly, in one way or another, to educational investigation.

Comparison with previous programs brings out certain features of distinct interest.[1] Measures of emotional traits appear largely for the first time on such a program. The writer cannot but feel that the appearance of work along these lines is of very great significance. And the work comes largely from hard-headed investigators of

[1] It would be an interesting study to compare programs over a period of years, and so follow fads and fashions in psychological research! The programs of even four years ago look antiquated now.

personnel problems in big business. That these workers should find measures of general intelligence decidedly inadequate, in selecting good salesmen or executives, surely suggests the possibility that the present great emphasis upon the intellectual endowment of the child, as the all-important factor in the educational situation, may be one-sided and inadequate. And the vigorous efforts at measurement of these extra-intellectual traits in personnel work should stimulate analogous effort to measure temperament and character in school children. The writer ventures the prediction that five years from now tests of interest, emotion, moral trends, will be quite as informing as measure of intelligence. But now for the papers themselves.

It has been said that the importance of a paper might be measured by the amount of discussion it arouses. So evaluated, Professor Thurstone's was the all-important paper of the first session, in spite of the fact that it treated that threadbare topic "What Should be Taught in the Elementary Course?" (in psychology). For the average teacher who has dragged through the weary series of pedantries and banalities which make up the usual elementary course in psychology, Professor Thurstone's ideas should refresh and delight. He dares to imply that knowledge of the cold spots and the end-organ of Krause, theories of visual contrast, or introspection regarding the thought process, may not be so fundamental for an introduction to psychology as current practice might suggest. And he would prefer that the elementary course should treat more of characterology—would like some little reference to Freud, and discussion of mental hygiene. Surely it is such study of character traits, life motives, emotional trends, conflicts and compensations, that needs more consideration in educational psychology.

Other papers appearing in the session for general psychology dealt for the most part with topics hardly of interest to a school man. Similarly technical and hardly of interest to readers of the Journal were most of the papers dealing with learning. Six papers were concerned wholly or in part with the learning of mazes; such work is of great interest and importance in analyzing the fundamental factors involved in the learning process, but can hardly be reported here. A "Report on a Series of New Learning Tests" by Augusta F. Bronner of the Judge Baker Foundation, Boston, deserves mention, however, also do papers by Robinson (University of Chicago) on "Distribution of Effort in Memorizing and Its Effect upon Retention," and Edwards (University of Georgia) on "Methods of Study."

The papers dealing with problems in clinical psychology were not, perhaps, so numerous as might have been expected, in view of the great activity, at present, along these lines. G. W. A. Luckey (Lincoln, Nebraska) discussed "The Services of the Clinical Psychologist." He emphasized the importance of such adjustments as the clinical psychologist aims to bring about, and stressed the need for clinical study in the elementary schools and in juvenile courts. No child, he asserted, should pass through the elementary schools without receiving a mental and physical examination by the best of experts. Dr. Goddard, of the Ohio Bureau of Juvenile Research, emphasized the importance of qualitative as well as quantitative differences in ability. It is not sufficient merely to obtain an I. Q. or mental age on the Binet scale; an individual may be psychopathic or abnormal with an I. Q. of 100 or 140 as well as with an I. Q. of 75 or 50. Dr. Mateer, also of the Bureau, discussed "The Clinical Significance of the Kent-Rosanoff Association Tests." Such investigation of free association has been found valuable by the Bureau, in intensive study of atypical cases.

Wallin, of the Psycho-educational Clinic at St. Louis, presented a "Comparison of Three Methods for Making Initial Selection of Presumptive Mental Defectives,"

in the public schools. The three methods were (1) initiation of examinations left entirely with the individual schools; (2) selection, by the Psycho-educational Clinic from preliminary reports made by the elementary schools (the reports being compulsory for all schools) twice annually on a prepared form, of children judged to be most deficient mentally; and (3) selection of pupils making the lowest scores in a group intelligence test (Pressey Primer). The second method proved most satisfactory—although a correlation of 0.73 was found between group test and Binet.

Buford Johnson (Johns Hopkins) presented an interesting paper dealing with mental measurements of undernourished children. The total number of entrants to the first-grade classes of a public school in New York City were measured for selection of the undernourished. Out of the group of 126, 40 were found from 8 to 20 percent underweight, with an average of 11.6 percent. These were segregated into one class for study. A control group was formed of 41 boys nearest the normal standard, with an average percentage overweight of 0.83. The tests showed the nutrition group to average above the control group in intelligence. In the nutrition group those with the highest intelligence gain weight fastest. It is concluded that "other things being equal, especially the levels of intelligence, children from 8 to 20 percent under weight compare favorably with other children in mental traits."

Bridges (Ohio State University) presented data regarding the "Correlation between College Grades and the Army Alpha Intelligence Tests," as worked out from a total of nearly six thousand cases at Ohio State University. The correlations averaged 0.36. There were, however, large variations from college to college—the largest correlation, 0.54, appeared, curiously enough, in the college of agriculture, the lowest, 0.22, in the college of engineering. Marked variations from college to college were also found, in the comparative value of the tests. In conclusion it was stated that "these results seem to indicate that intelligence tests for university students should be selected and standardized for the different colleges separately, or that in addition to a general intelligence test for all students there should be specific tests for the students of the different colleges."

An important paper by Book (Indiana University) dealt with the "Intelligence of 6188 High School Seniors Going to College." It was found, in this state-wide survey, that about as many of the very dull as of the very bright high-school seniors plan to go to college. However, taking the groups as a whole those intending to go to college rank slightly higher than those who do not; those intending a liberal arts college rate slightly above those planning a technical education. Better integration between college and high school is urged. Two papers dealt with the relation of degree of Indian blood to intelligence (Hunter, University of Kansas, and Garth, University of Texas). In general, the more Indian blood the less score on the tests. Waugh (Berea College) gave comparative data regarding Oriental and American student intelligence. The differences were for the most part in favor of the American group. Mrs. Arlitt (Bryn Mawr) dealt with the influence of race and social status on the I. Q. A group of Italian children was found to average only slightly above a negro group, while a native white group stood out as clearly superior in intelligence. Also, children from homes of superior social status scored strikingly higher than children from poor homes. In fact, these differences due to social status were greater than those due to race. Miss Stecher (University of Iowa) showed, on the basis of repeated examinations, the comparative constancy of the I. Q. Porter (Clark University) pointed out certain uses of group tests of intelligence in college and industry.

Certain miscellaneous papers remain for brief mention. The tests for non-intellectual traits have already been referred to. Dr. Downey's work in particular is of great interest, but hardly permits of adequate description here. The important thing is that a definite beginning has been made, in measurement of temperament, interest, and emotional trends. Terman (Stanford) gave certain striking facts regarding a juvenile author, now barely nine, who composes either poetry or prose with astounding facility, by her eighth year had read 750 books, had the vocabulary of a university freshman. Her I. Q. is 188. She is two years advanced in physical development, has exceptionally good health, appears of normal temperament and emotional make-up. Last among these miscellaneous papers may be mentioned a brief presentation by the writer of an examination for investigating graduation standards, in departmental school. The examination consists of tests in reading vocabulary, grammar and punctuation, American history, and arithmetical reasoning.[2]

Following the annual dinner came the address of the president, S. I. Franz, which dealt with recent data showing the possibility of relearning, after injury to various portions of the cerebrum in which certain functions were supposed to be exclusively localized. Following this, reminiscences of Wundt were given by several of his former students. The address, the afternoon preceding, of the retiring vice-president of "Section I" (Dr. R. M. Yerkes) dealt with the need for more adequate psychological training of physicians. The symposium consisted quite largely of the usual protests against the uncritical character of present work with tests—protests which are deserved enough, goodness knows, but which would be more appreciated if they were accompanied by constructive efforts at improvement.[3]

At the annual business meeting thirty-five new members were voted into the association. There was an indeterminate discussion regarding the licensing of "consulting psychologists." The election of Professor Margaret F. Washburn, of Vassar College, as president for the next year, was announced.

It should be mentioned, in closing, that a number of members of the Psychological Association presented papers in the Section for Education of the American Association for the Advancement of Science—which has been reported in a previous issue of this Journal.

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[2] Two other bits of work, of no practical interest to school men, nevertheless have sufficient intrinsic interest to be worth mention. Burtt (Ohio State) reported results to show that falsification of evidence, in testifying before a jury, might frequently be detected by peculiarities in the record of the breathing of the witness. Finally, Hull (University of Wisconsin) told of a charming bit of experimentation in which, for study of the effects of smoking, he had his subjects smoke a pipe while blind-folded. He then occasionally substituted for the pipe a similar-drawing mouthpiece through which the subjects sucked simply moist hot air. And we are told that "confirmed smokers would puff the warm air with evident satisfaction, and even go serenely through the motions of blowing smoke-rings!"

[3] The fundamental fact, of course, is that we lack in "pure research" with tests, because the older type of psychologist has not been willing to support such work.